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COMPLETE GUIDE TO HOME GARDENS

Complete Guide to **HOME GARDENS**

EDITED BY

M. JAMES, F.R.H.S.

*Assisted by many Experts
covering all branches of
- - Gardening - -*

FOREWORD BY

S. P. B. MAIS

*Full coloured Frontispiece,
64 pages of Plates and
Numerous Illustrations in
- - the Text - -*

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FOREWORD *by* S. P. B. MAIS

THE ENGLISH GARDEN

JUST before I started home after my recent series of broadcast talks in America, the American people asked me to give a special talk about England, a request to which I acceded the more willingly because I feel that many visitors fail to see the true England.

And in my endeavour to interpret England aright I said this:

"If you want to reach the Englishman's heart most quickly, just lean over the gate and praise his garden."

It is indeed much truer to say that we are a race of gardeners than that we are a nation of shopkeepers. Many of us are bad shopkeepers, but practically every Englishman is a good gardener.

This national love of gardens springs from our national love of beauty. Much more than other men is the Englishman susceptible to sweet scents and harmonious blends of colour in his landscapes. He is not impressed by size. What he likes is a rose-plot of his own, where he can watch the results of his own exertion and enterprise.

Whenever I visit a strange house I find that my host and hostess are always more anxious for my opinion on their garden than on their library or their furniture. That is because the furniture and books were not of their own making, whereas the garden usually is.

They have a definite say in the choice of what shall bloom here, and the shapes of this flower-bed and that. More often than not they have dug up the soil themselves, freed the ground of weeds themselves, and planted the seeds and bulbs themselves. A back-breaking job digging, but a marvellous cure for most of the ills that flesh is heir to. It induces the right sort of physical tiredness, and dispels all worry.

It is its own reward, quite apart from the reward of seeing two blades grow where one grew before, or being able to conjure colour, scent and beauty out of an overgrown cabbage-patch of ugliness.

Gardening is both the purest and the most disinterested of human pleasure, for in giving pleasure to yourself you give pleasure to all passers-by.

How often do I find myself recalling pleasant haunts of my youth by the flowers that I associate with these places, cottage-gardens

in Devon riotously flamboyant with hollyhocks and giant sunflowers, peonies and asters, sweet peas, and roses clustering over the porch.

Gardening is the most democratic of pleasures, for by singular good fortune the loveliest flowers are the most prolific and the cheapest. No flowers give a happier augury that warmer days are coming than the dancing daffodils.

No flowers give a sweeter sense of old-world homeliness than mignonette, wallflowers and sweet-williams. No flower is more graceful than London Pride, more glowing than a marigold, or more calculated to fill the home with happiness than an English rose, and all these are cheap, prolific, and easy to grow.

There is too the symbolic significance of our flowers: "Pansies, that's for remembrance." How often the sight of a simple flower, like a geranium or night-scented stock, has the power to revive most poignant memories that we had thought to be long since buried. How the scent of an early bunch of violets in a city street can take us back on the instant to the garden in the country that we loved long since and lost awhile.

Each month sees the garden put on a fresh panoply. There is the panoply of blue in June when the Canterbury Bells, lupins and delphiniums turn the garden into the Mediterranean Sea. There is the golden panoply of the autumn, and the chill purity of the fresh snowdrops and crocuses of earliest Spring.

There is a peculiar delight in eating peas that you yourself picked and potatoes that you have yourself dug. A garden is only half a garden that is limited to the cultivation of flowers, just as a life is only half a life that is limited to the cultivation of the æsthetic. It is the happy combination of the utilitarian with the beautiful that makes gardening so dear to the average Englishman.

Every evening in the summer, every Saturday afternoon throughout the year, you see city men released from bondage with pitchfork and hoe, barrow and spade setting out to conquer and beautify the land that is entirely their own.

Often they scowl and pretend that they regard it as a further slavery, but in their hearts they are singing, because they are really back to childhood days again, planning a brave new world, here a rock garden, there a stream, here a pool and there a trim lawn.

The explorer and prospector in man at last finds full scope in his garden. That is why life in a flat is to so many men like life to a bird with clipped wings; why life in a flat for children is almost a negation of life altogether; for children, no less than dogs, need room to roam, and the street is no fit place either for dog or child.

Indeed, childhood recollections are more bound up in gardens

FOREWORD

than anything else, and certainly children owe more to days spent climbing trees in the orchard, making caves under the laurel bushes, watching their own beds of mustard and cress and radishes grow, and helping to pick strawberries, gooseberries, raspberries and beans than to any other single influence at that time.

One may forgive a man who is unable to appreciate music, and blind to the appeal of the great masters of painting, but the man who fails to find a genuine happiness in the sight of a garden and fails to desire to cultivate it, is at least as suspect as the man who does not like dogs.

The great gardens of England so generously thrown open to the public through the summer to help the Queen's nurses, never fail to fill the foreigner with an admiration that surpasses even the admiration he feels for our landscape.

And certainly one of the first things that the average Englishman would do on winning the Irish sweep would be to buy a house containing one of those superb examples of the loveliness that is our national heritage.

But the little gardens of England are no less miraculous. Glance out of any railway carriage window and see what miracles men of limited means and limited accommodation have achieved with a plot of earth about as big as a billiard table.

Unemployed men have turned the arid wilderness of a deserted factory site into a blossoming rose, and men whose lot is cast in an area of chimney pots and squalid streets have contrived to bring an atmosphere of sweetness and light where both were sadly lacking.

But most of us are neither rich enough to own a garden as remarkable as that at Lowther Castle, nor poor enough to have to rely on a window-box for all our colour and scent.

A garden of some sort is within the reach of pretty well everybody. It is usually just laziness or ignorance that prevents us from getting that meed of enjoyment that is our right.

There cannot be too much colour, too many sweet scents, or too many lovely curves in the world. Beauty always serves to increase beauty.

Our gardens serve as perpetual reminders of that happy fact.

AUTHOR'S PREFACE

IN THE BEGINNING

AS far as we know, when the human race emerged from the animal state and began to manipulate other forms of life for its own needs, the first step in this direction was the cultivation of plants. Before that time, our ancestors undoubtedly lived on the natural fruits and wild animals, and in time of shortage no doubt many of the human race succumbed to the effects of famine.

With the increase of intelligence, however, man discovered that by collecting seeds, and moving plants, he could make alterations in the natural vegetation, and could thereby supply himself with food with more certainty and regularity than was possible before.

We do not know how soon in the course of evolution man began to realize the æsthetic possibilities of gardening, but we know that some of the earliest works of art drew their inspiration from field flowers. Lilies, apparently of the Madonna type, are outlined on many of the early vases, and it is reasonable to suppose that, although food supplies were the first objective of primitive man, he was also somewhat affected by the beauty of the flowers and the plants that he began to cultivate.

FLOWERS NOW TAKE PRECEDENCE

In the modern garden—the patch of ground immediately surrounding each home and cultivated by or under the supervision of the members of the household—flowers are of even greater importance in nearly every case, than are vegetables. Certainly, the smaller the garden the greater prominence is given to flowers, and it is only in the very largest gardens that vegetables are grown to any great extent. It may be for this reason that gardening, to most people, has ceased to become work and is now regarded entirely as a hobby.

The amount of joy and happiness which can be obtained from the cultivation of even a small garden of five rods is incalculable. As modern building proceeds, it becomes more and more evident that some garden space is wanted by nearly every household, and it is very gratifying to notice that the old back-yard, that is, a paved space where washing could be dried but nothing could be grown, has disappeared from the

AUTHOR'S PREFACE

new towns of this century. Except in the case of large blocks of flats, no house to-day is built without some garden surround, and no garden is entirely neglected without severe and adverse criticism from neighbours. It is a matter of as great importance to the credit of the household that the garden should be kept neat and tidy, as that the house windows should be kept clean and bright.

Gardening is, however, a very highly specialized craft. Rule of thumb methods handed down through the ages certainly achieve good results, but the town dweller who has had little contact with the soil until the time when he takes possession of a new house and a small plot of ground, does not know these rule of thumb methods, and if he is to make the most of his little garden he needs help and advice from specialists.

To put the best of modern knowledge before him in an easy and simple form, so that his labour in the garden is lessened, and his results improved, is the first object of this little book, and gardening will throughout be treated simply as *advice given by one friend who knows a good deal about flowers to another friend who can hardly tell the difference between a rose and a cabbage.*

In its preparation I have had the help of a large army of other gardeners—experts in the profession and experts among amateurs, craftsmen and scientists. Members of the horticultural trade have been particularly helpful. I offer my thanks to them all, feeling that to single out one more than others would be to make an unwarrantable distinction between friends who have offered me, without stint, the cream of their horticultural knowledge, the result in most cases of years of practical experience and research.

If this guide fails in its purpose of helping the novice to get the best from his home garden, the fault is mine. It is obviously impossible in a single book to deal exhaustively with every phase of garden making. I have tried to include those facts which, from a long experience of amateurs' problems, I know to be of most use to the beginner. But every garden has its special difficulties, and some who turn to this guide for assistance may be disappointed.

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COMPLETE GUIDE TO HOME GARDENS

SECTION ONE—LAYOUT

CHAPTER I

PLANNING THE GARDEN

DEVELOPMENT OF THE GARDEN FROM THE TIME THE BUILDER LEAVES—RULES FOR CHOICE OF DESIGN—MODERN STYLES FOR MODERN ARCHITECTURE—LABOUR-SAVING GARDENS—GARDENS IN SECTIONS—GARDENS FOR HOUSING ESTATES—SUITING THE SURROUNDINGS—FRONT GARDENS—KITCHEN GARDENS—BUNGALOW GARDENS.

LET us start first of all with the assumption that we have a plot of land on which a house has just been built, or is about to be built, and that from this land we are hoping to make a garden.

Obviously, the first thing to do is to go and look at the plot. If it is an ordinary rectangular-shaped plot—such as is found by the thousand behind, and in front of, small houses—there is no need at this stage to draw an elaborate sketch; but if the plot is at all odd-shaped, it will be well, first of all, to make a rough sketch of the boundary lines to scale, so that a plan can be made on paper to which the gardener can work.

The next thing to do is to examine the soil itself, and to notice whether the surface is flat or sloping. Small mounds of soil that have been dumped by builders can, for the moment, be disregarded, but the general lie of the land should be considered. If the garden slopes down towards the house, the best pictures will be seen from the house windows, but if it slopes away from the house, the best views will be those seen from the end, looking back towards the house, or those spread carpet fashion below a balcony or terrace. Any abrupt slope should therefore be noted, and it may be advisable to draw a rough sketch showing this slope as a sectional diagram.

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Other points can now be noted for the guidance of the garden maker. For instance, any large trees, either on the plot itself or in the immediate neighbourhood, can be indicated on the rough sketch. Any particularly fine view, if it is likely to be a view that will remain, should be noted also, and the existence of other houses or ugly out-buildings, factories, etc., should also be considered. To make a perfect garden, these will need to be screened from view.

SOIL CONDITION

Next, examine the soil itself and consider its condition as regards moisture. Most plots do not have a natural stream running through them. If they do, this will of course be carefully noted on the rough plan, and the gardener may consider himself fortunate, as the presence of water on the plot will make it possible for him to get far more variety into his layout than is usually possible. Even where there is no stream, it is quite possible that the garden will appear to be rather over-moist, and if there is very much water standing on the surface it may be necessary to improve the drainage. However, before any drainage operations are undertaken, the reason for the stagnant water should be ascertained. If it is merely that the top soil is of sticky clay, through which the water drains but slowly, thorough digging and liming will remedy the condition.

If the garden is on a slope and receives the surplus moisture of other gardens that are higher up on the same slope, the problem may be more difficult. It happens at times that gardens on a slope are more or less terraced, that is to say, the border by the side of the fence in one garden may be built up above the level of the soil in the neighbouring plot. This state of affairs almost invariably means that the lower border will be excessively damp. In the case of any *very serious* water problem it is advisable to call in an expert. Any local nurseryman or landscape gardener would probably be willing to oblige in this matter for a small fee (or even without a fee if you are a likely customer), and such an outlay would be very advisable, as it might mean all the difference between success and failure in the subsequent cultivation of the garden.

Generally speaking, however, a small garden is well enough drained by the existing main drains such as are always laid on housing estates, and there is no need to do more than drain the lawn and borders by good cultivation.

CHOICE OF DESIGN

Having collected, as far as possible, all the information regarding your particular plot of ground, you can retire to your study with a pencil and paper, and proceed to plan your new garden. Here, of course, your

PLANNING THE GARDEN

own personal taste and artistic ability will show themselves. No two gardens can ever be exactly similar, and it would be undesirable if they could. For one thing, no two persons have the same ideal regarding gardens; and for another, no two garden plots can ever be exactly alike. However, there are certain points which must be considered in the planning of every plot. The first is the use to which the garden will be put. The tiny "pocket-handkerchief garden" in front of a small house is obviously suitable for decorative purposes only: that is to say, you can plant it as a lawn with a ribbon border of flowers round it, or you can fill it with ornamental flowering shrubs, or you can possibly make a small rock garden or sunk formal garden in such a position, but it will generally be quite unsuitable for the cultivation of fruits or vegetables.

A similar small plot at the back of the house can, however, be used for any purpose. If it is of a medium size, it may be possible to have a fair-sized lawn on which games could be played—clock-golf, croquet or tennis, according to the size—together with flower borders and possibly even a small vegetable plot, or fruit garden.

The needs of the household largely determine the type of garden to be made in the rear of the house. Very small children demand a play-ground, and it may be that in addition to a lawn a small plot entirely for the use of children could be arranged. In this could be a sand-pit for the toddlers, swings for the older children, or even a cricket-pitch, according to the size of the ground available. Older sons and daughters will doubtless prefer a tennis-court.

Those who are not interested in games will still like to have a good-sized lawn on which open-air meals can be taken; or, as a substitute for this, some sort of garden house where shelter and sunshine can be enjoyed in full view of a picturesque scene across the garden.

There is also the domestic side of the garden: that is to say, the need to hang out washing and perform other domestic duties outdoors must be considered.

The keen gardener who has reached the stage of wanting to specialize on one form of garden, may like to set aside a portion for a rose garden or a rock garden, or some other special garden.

The initial work of layout is therefore to decide what types of garden are wanted, and to find a suitable place for each of these within the boundaries of the plot.

As a general rule it is advisable to put the more formal types of garden near to the house and the informal types at a greater distance, but this rule can occasionally be reversed; in fact, there is no hard and fast rule about garden design on this point.

When the position of the various sections has been roughly indicated

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on a sketch plan, the next thing to do is to link these sections by suitable paths, and to divide them from one another by suitable screens.

MODERN ARCHITECTURE

A point that might be noted here is that any garden design should be suited to the architecture of the house. Modern styles of architecture are severe in outline and "stream-lined." A corresponding stream-line effect can be obtained in the garden—or at least in that part of it which is nearest to the house—by using broad flat stretches of grass, divided by straight or slightly curved paths, the grass being edged with a 4-in. wall of cement. Formal clipped shrubs or pyramid conifers would be the best subjects to associate with the grass in this section.

PATH DESIGNING

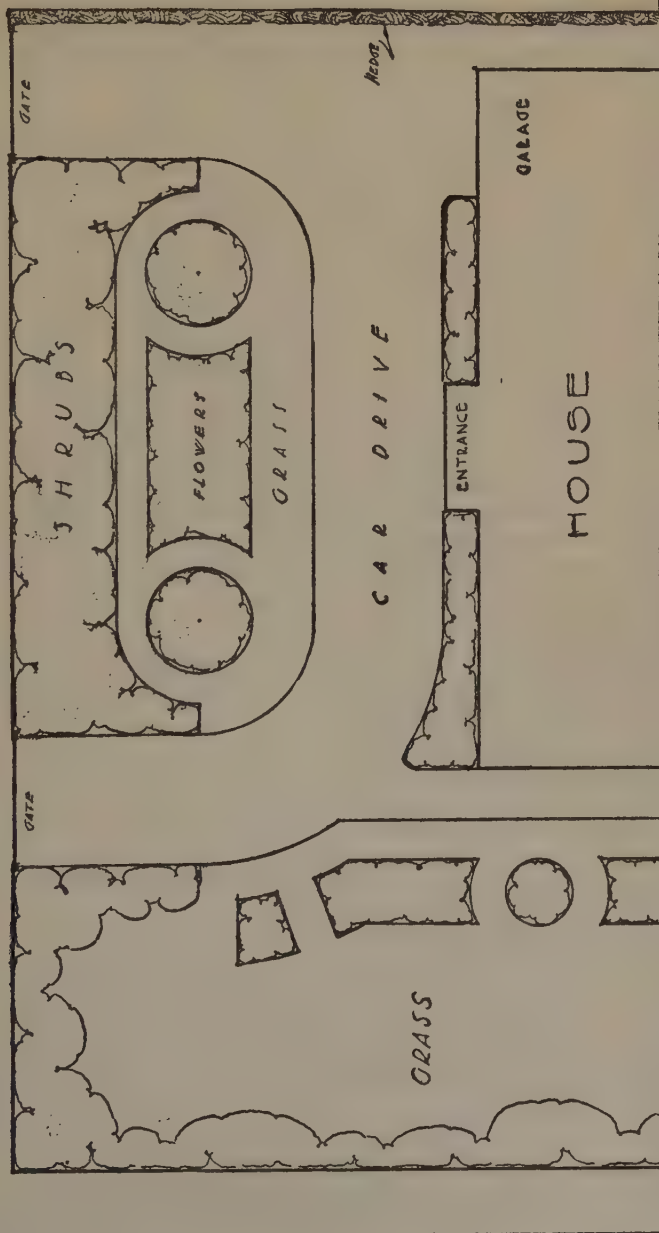
Paths should be at least wide enough for two people to walk abreast along them, and in the small garden it is better to make the paths straight than winding, as sharp curves in a path tend to become irritating. Also, in the small garden, a long straight path can be utilized to create a pretty vista, either by making herbaceous borders along each side of the pathway, or by roofing the pathway with a series of arches or a light pergola, covered with climbing plants. In making screens between one portion of the garden and another, the importance of vistas should never be forgotten. It is possible to create the impression of long distance in a very small space by suitable placing of screens, arches and other features.

At this stage, in the larger garden, the making of an approach to the house must be thought out very carefully. If there is a garage, a drive must be laid from the roadway to the garage itself, and where there is room, it is also advisable to allow sufficient space for the car to be drawn up immediately in front of the entrance. It should also be possible for the car to be turned round, or reversed into the garage with ease. To allow for the turning of the car, a circular space of twenty yards across (minimum) is necessary.

A suggestion for making and placing a car drive will be seen in the specimen plans. Apart from the points already mentioned, the designer should remember that it is essential, for the garden upkeep, to be able to *wheel a barrow* easily to every part of the garden, and well-made service paths are therefore of prime importance. It should also be possible to store fertilizers and tools, and provision must be made for easy access to the shed in which these are stored, both from the house and from the main road.

With these points in mind the details of the garden design can be sketched on the plan.

On the artistic side, the points to remember are that simplicity in design is always more effective than fussiness, and that nothing can be



A convenient form of drive is that which has two entrances. This saves reversing and allows for a decorative treatment in front of the house

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really beautiful which appears inappropriate, or which is badly managed. By this last point is meant that if labour is short the garden should be so planned as to be easily managed by the members of the household in their spare time.

LABOUR-SAVING DESIGNS

Certain types of gardens require far more attention than others. For instance, grass needs constant cutting and rolling, and although this can be done with a minimum of labour by the use of efficient tools, it is nevertheless important that it should not be neglected at any time. If regular attention is not possible, therefore, the amount of lawn in the garden scheme should be a minimum, and features that could be substituted would be paved areas, or banks of shrubs, either of which only need a minimum of care. Rock gardens of certain types need very careful and constant attention, while others (such as the boldly planned rock and water garden) can be left for long periods without attention.

A mixed flower and shrub border can be arranged that will need attention only perhaps four or five times during the year, while herbaceous or annual flower borders need weekly hoeing and weeding, staking and trimming, to keep them in condition.

As a guide to the novice, the various types of gardens may be roughly arranged in the following order, beginning with those that are most easy to manage.

- (1) Mixed shrub borders and paved paths, with shelters, formal pools and stone ornaments.
- (2) Lawn and shrub borders.
- (3) Wild gardens.
- (4) Rock and water gardens (not rock gardens that include rare alpine).
- (5) Rose gardens.
- (6) Formal gardens with seasonal bedding (if bedding plants are always bought).
- (7) Fruit gardens.
- (8) Vegetable gardens.
- (9) Formal gardens with seasonal bedding, accompanied by greenhouse and frames, so that plants are raised from seed.
- (10) Alpine gardens (including an alpine glasshouse).
- (11) Mixed gardens—with herbaceous borders, seasonal beds, rockery, frames, etc.

MATERIALS FOR CONSTRUCTION

The various materials used in the construction of gardens are dealt with in detail under other headings, but a few general principles

PLANNING THE GARDEN

should be kept in mind even while the first sketch of the garden is being made.

Any stone or brickwork used in the small garden should be such as will harmonize with the existing materials of the house. This does not mean that exactly the same type of brick must be used for the paths as for the walls of the house, but only that the harmony of the whole must be kept in view whenever new materials are bought.

LINK THE SECTIONS

Then again, some effort should be made to keep to the use of similar material in every part of the small garden. For instance, if rectangular flagstones are used for a formal section near the house, the same material is best for the path that continues down the centre of the vegetable garden. This will look from the house as if it were an extension of the flower garden, adding apparent size and distance, and will be far more harmonious than if the flagged paths ceased with the formal garden, and gravel or soil were used for the continuation. Paths from the vegetable plot that are *not seen* from the flower garden can, of course, be of different material. The most important thing to remember is that each section of the garden should be successfully linked with the next.

In the same way if a pergola leads from the house door it will look best if the material harmonizes in some way with the material used for the house, or where this is not possible, the link may be made by planting similar climbers over the pergola to those over the house porch.

Should the house be surrounded by a paved portion, finished with a low terraced wall, the stone or brick used for the terraced wall should harmonize with that of the house, and any other stone work in the immediate vicinity of this terrace should be of similar material.

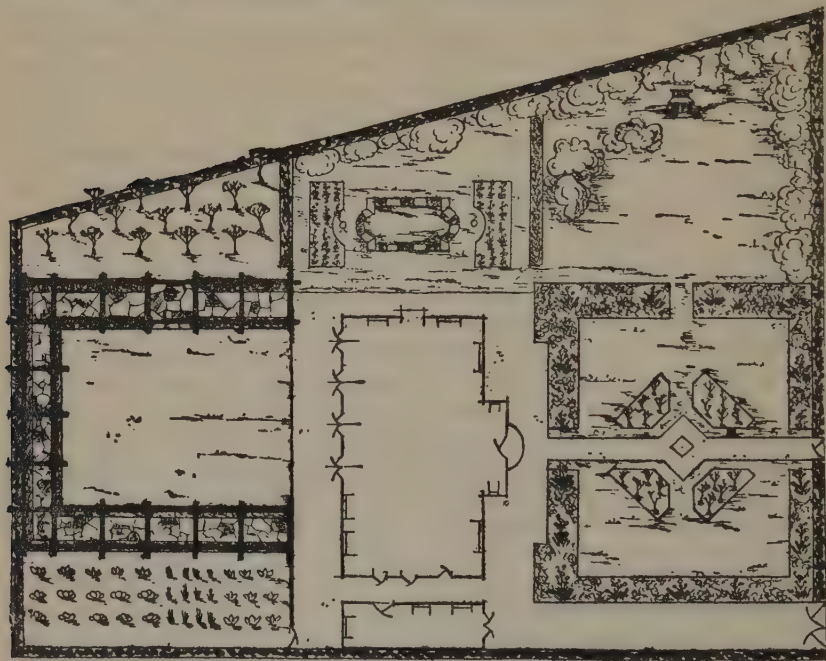
When all these points have been decided, the sketch plan should be completed to show the exact position of each feature, indicating the material to be used, and also the plants that will be required for the furnishing of beds and borders. As each garden will have its own particular problem, it is not possible to give the exact order in which the work should be undertaken, but the ideal method of planning a garden where there is a shortage of labour, and the garden cannot be made all at once, is to have a detailed sketch of the whole, and then to start on the most essential features first, dividing the work over a period of three or four seasons. For instance, where the gardener intends at some later period to specialize on roses and to lay down flagged or grass paths between small geometrical beds, he may not be able to complete this section hurriedly. He may then, possibly, use the site of the intended rose garden during the first season for the cultivation of a crop of potatoes. This serves a double purpose. It frees the plot of weeds and also of pests such as wire-worms,

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and breaks up the soil so that it is in good condition for easy working. Meanwhile, more time can be given to the development of the other parts of the garden in a permanent manner.

PLANNING TYPE GARDENS

We cannot sketch the garden plan without special consideration of the way to place the specialist gardens, and gardens of definite type, when these form a part only of a larger garden. As already stated, it is best to make



When the house is set to one side of the site, a number of small intimate gardens can be designed. These should, however, all be linked up to form a harmonious layout

a clear division between each, by planting an evergreen hedge, by erecting an ornamental screen, or arranging a bank of shrubs, pergola, or similar device. In the case of a sunk garden this division hedge is not so necessary, as the lower level in itself separates the sections sufficiently.

It is obvious, however, that a series of gardens, each absolutely screened from the others, would not make a satisfactory scheme. There must be a bigger conception than this, if the whole garden is to become an entity. Sudden changes from one type to another should not be overdone. For instance, a garden of formal design near the house,

PLANNING THE GARDEN

following the lines of the house and side entrances, can be allowed an exit at one corner, where steps lead down through a rock and water garden. Two other exits from the rock garden might lead to an orchard and vegetable plot, and to a piece of semi-wild woodland garden respectively, *each in turn connected with the other*. But it becomes almost an absurdity if a formal garden leads to woodland, thence to a formal sunk garden, thence to an orchard, and finally to a rose garden, with high hedges surrounding each, and no other way of return to the house than by retracing one's footsteps.

When you start with a plan of the boundary and house in front of you, there are two ways in which you can begin to plot the various sections. With a large plot it is best to take the largest section first, give it a good position, and then proceed to the smaller ones, finally filling in the odd corners left unallotted. With a small but irregular shaped plot you can do the same; or, alternatively you can begin from the outer boundary, putting first a division hedge, then shrubbery where thick screening is wanted, then a border—straight or curved—of flowers, and finally filling the centre plot with lawn. The first method is best in most cases.

PLACING THE WATER GARDEN

Water and sunk gardens have this in common, that they must occupy the lowest portion of the ground. This not only saves expense in construction, but also adds considerably to the beauty, since water is most delightful seen from above. To some extent it decides whether the pool shall be of formal or informal design. If the lowest portion of the garden is near the house, a formal pool will be best; whereas if it is at a distance, the pool can easily be included as a part of a wild garden, should formality be disliked.

There are naturally some difficulties to be overcome when sunk gardens are contemplated. First of all there is the disposal of the material removed, which generally seems to the novice, to become like the widow's cruse of oil—the more he carts away the more there is left! If a rock garden also forms a part of the scheme, the subsoil will be found useful for the banks. The top 10 in. of soil in a garden is the most fertile, and must be kept as surface soil. It is necessary therefore, in making a sunk garden, to remove the top layer first and stack it in a heap; then excavate as required, and lastly return the top soil to the beds and lawn of the sunk portion. Even where the garden is to be sunk only a foot or so, it will be seen that the work entailed is considerable.

Another point the garden maker must be prepared to face is the question of drainage. A sunk garden naturally receives the surplus water from the surrounding portion. Should there be springs, or should the surrounding land be exceptionally wet, it may be essential to provide

special drains. On the other hand, the building of a rockery retaining wall round the sunk portion, the laying of turf and flagstone paths, with a cement-lined pool, may complete the construction of a sunk garden on favourable sites.

Although lawn construction, and water gardens are both dealt with elsewhere, a few remarks may be appropriate here on both subjects. The lawn of a sunk garden may constitute its chief feature. A stretch of green, broken only by a specimen plant such as Pampas grass, or *Yucca gloriosa*, with a couple of well-made garden benches, is delightful, but only if the grass is perfect. Unless every care can be given to the turf, I should advise using flagstones and flower beds rather than lawn. If water is used with grass, a pool with flat stone edges laid flush with the turf, is both easiest to manage, and most beautiful. Raised coping stones round the pool do not usually harmonize well with the general appearance of a sunk garden.

Details of the requirements of water plants and fish, and the sizes and depths of pools for their maintenance, are discussed in CHAPTER X; but while the general layout of the garden is still being discussed, it is necessary to think of certain practical needs. Water in any form in the garden must be replenished regularly. Still water, in the form of a pool where water-lilies are grown, needs only to be replenished during dry weather by means of the ordinary garden hose. A very tiny pool need not, therefore, be supplied with inlet or outlet, so long as it is kept sweet and fresh by a correct balance between the plants and fish that inhabit it. In practice, however, I have usually found that such a pool is unsatisfactory, and should strongly advise every owner of a formal pool to arrange (1) for a satisfactory inlet by which the water can be kept to the desired level; (2) for an outlet just at the surface level, so that surplus water is carried away, and does not flood the surrounding ground; and (3) for a *good drain at the bottom* which can be used when necessary to empty the pool.

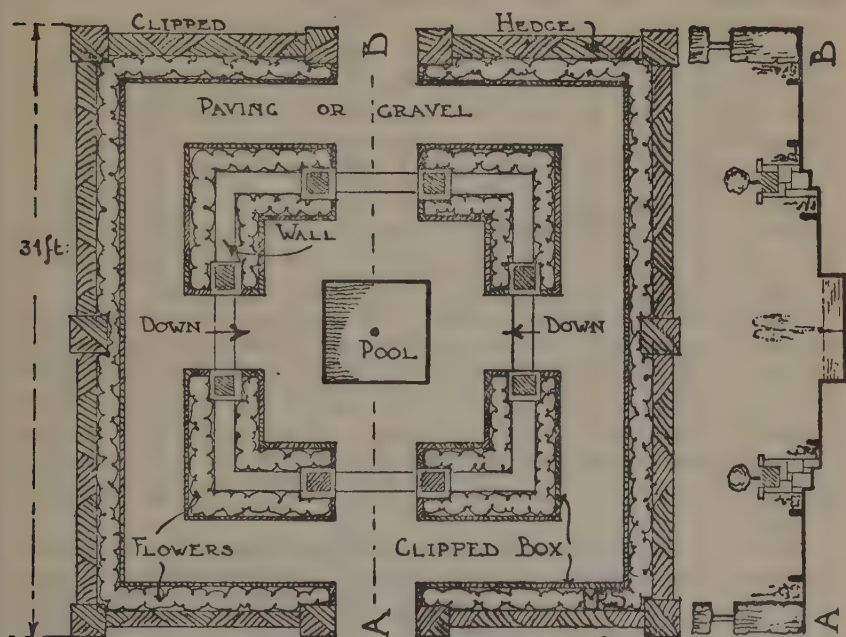
It may be thought that the last is not required, and certainly if the correct balance of animal and vegetable life is present, the pool may never need cleaning out. It is often the case, however, that at certain seasons the water becomes choked with leaves blown from near trees, or is fouled by other means, and the ability to empty the pool quickly, clean it thoroughly and refill, is then greatly appreciated.

This brings us to the further point that the construction of a water garden should be accompanied by the construction of a deep sump, into which surplus water can be drained. Failing this, of course, the surplus can be carried back to the main drains. Should a sump be the method adopted, its position and construction are matters to receive attention in early stages of the garden layout.

PLANNING THE GARDEN

TYPE GARDENS FOR HOUSING ESTATES

Let us now consider the various types of garden which the ordinary amateur gardener may wish to make. They may occupy the whole garden, each being suitable for a small garden plot such as that available on the average housing estate, or they may be merely sections of a larger garden. It is desirable for every garden-maker to have a theme underlying his plan. He probably always does so, since everyone has some idea at the back of his mind when approaching the problem, but it is as well to *keep this theme in the forefront* whenever the garden is being remodelled. For instance, a garden may be an *old-world garden*, possibly attached to a modern house built in the Elizabethan style. If this is so, almost every



A formal Dutch garden should include such features as a pool, gravel or paved paths, clipped box edgings and clipped hedges

section of the garden, or at any rate, those sections which are near the house and seen from the house windows, should have a little of the old-world in their make-up: that is to say, plentiful use will be made of lavenders, lilies and other old-fashioned plants. Crazy paving or random flagstones along the paths add to the old-world appearance. The edges of such paths should be softened by creeping plants such as

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cerastium, arabis and so on; and arbours, rustic seats, sundials and quaint old stone ornaments are acceptable in a garden of this type.

There should be a distinct theme behind every garden. For instance, if a *cottage garden* is being planned it is best to keep strictly to the idea of a cottage garden, and formal bedding should not be permitted. In some cases the existing features will establish the theme in the garden. If old woodland is being cut up into fair sized plots for building, and a considerable number of the old trees are left at the end of the plot farthest from the house, the garden-maker will instinctively reserve this portion as a *semi-wild garden* or shrubbery. If his tastes run to formality he will keep the formal portion near to the house and gradually lose formality towards the end of the plot. On the other hand, if the building area was formerly a fruit orchard, and old fruit trees still exist in the garden that is to be taken over, it may be very desirable to keep them as they are, specially if grass exists beneath the trees. In this case it might be satisfactory to restrict the garden development to the planting of flowering shrubs and perhaps one or two flower patches, and to make the major portion of the garden still an *orchard garden* where spring, summer and autumn bulbs come up annually in the grass under the trees. This type of layout, of course, is essentially a labour-saving one, particularly if the bulbs are restricted to a small area round the bole of each tree, so that the remainder of the grass can be conveniently cut during the summer and the parts where bulbs are growing left to their own devices.

Then again, if the house is built on a site where rock stone occurs, an easy and very satisfactory way of designing the garden would be to turn it into a *Rock and Water Garden*. If the slope is rather sudden, artificial cascades of water can be arranged to fall over stones into a series of pools. This is quite possible even in a small garden, as a trickling cascade of water needs only the installation of a tap at the highest level and the arrangement of a sump at the lowest level to take the surplus water.

Other special gardens include, of course, the Japanese, Dutch, Spanish, Italian and other foreign types, and though these are usually just made as a matter of personal preference, they are sometimes dictated by the furnishing of the interior of the house. For instance, should the Garden Room or loggia be furnished in Japanese style, it could quite happily lead to a small Japanese garden.

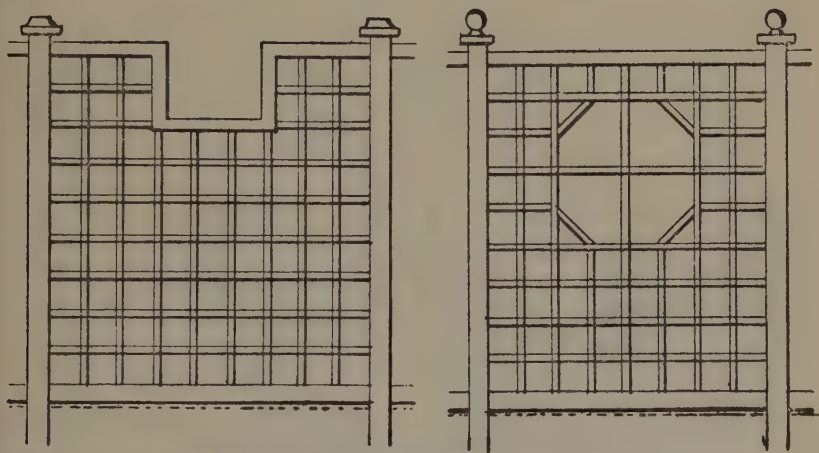
THE FRONT GARDEN

The small patch of ground in front of a house is a type of garden which needs special treatment. It is not necessary to make this garden absolutely secluded. One could, in fact, wish that the American style of making the garden lead right down to the footway were more common

PLANNING THE GARDEN

here. The house is then in a floral setting, but not cut off from the public footway by any formal barrier. Unfortunately, many of our amateur gardeners still cling to the idea of putting a high hedge along the front boundary so that passers-by cannot see any of the garden beauty.

When the plot is very small it is perhaps desirable that the house windows should be somewhat screened from the footway, and one excellent way in which this can be achieved in a small garden is by the erection of a light trellis, say about 4-6 ft. from the front windows. This



Strong trellis can be made in various pleasing designs and makes a good home for many beautiful climbing plants

must not be a close screen nor very high, and should have foot square openings between the laths. It can be decorated with several varieties of climbing clematis to flower in succession from spring to autumn. From the screen to the roadway the garden may then be left open so that the full beauty of the lawn and flowers is seen by passers-by.

For hedges in front gardens, the amateur is advised to try something a little more original than the monotonous privet, so common in older gardens. The small-leaved *Lonicera nitida* makes quite as thick and close a hedge as privet, grows quite as easily, and is becoming more and more popular. For this reason I hesitate to advise its use, since it threatens to be just as monotonous as privet. I would rather suggest, even in the small garden, the use of Sweet Briars, which are very fragrant all through the summer and are also generous with their flowers of buff and crimson shades.

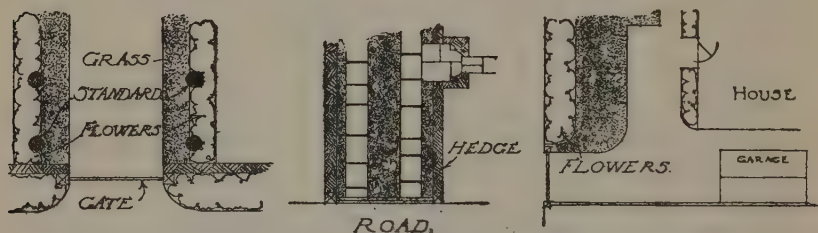
Others of the rose species, for instance *Rosa moyesii* and *Rosa rugosa* also make good hedges and provide both flower and ornamental berries in season.

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Another way to finish the front boundary of a little garden is to build a low wall, behind which a small border is banked. In the high border can be grown bushes of lavender or a similar dwarf evergreen shrub, which will gradually grow over the top of the wall. If preferred, the wall top itself can be planted with aubrietia, arabis, wallflowers, or antirrhinums, making a floral boundary instead of an evergreen hedge.

When the garden is large enough, hedge plants of rather more spreading habit than *Lonicera nitida* can be used, and the different varieties of Berberis, or double-flowered gorse, are ideal. Neither dogs nor children will damage a hedge made of spiny subjects such as these.

For the tiny, square front garden, a simple design such as a central patch of grass with a ribbon border of flowers and a neatly clipped hedge is better than any attempt at elaborate planning. To give such a garden individuality and character, a single specimen plant in the centre is



The car entrances attached to medium sized houses are often very bare and uninteresting. Here are three suggestions for pleasing treatments

sufficient. A weeping standard rose, if the garden is sunny, makes a useful feature of this kind; or, if the garden is shady, a plant of Yucca (Adam's Needle) or a standard Fuchsia may be used. Standard plants are particularly useful in small front gardens because they enable the flowers to receive more air and sunlight than is possible when dwarf bushes are grown. Standard roses, for instance, along the side of the front entrance will lift their heads above a 3 ft. hedge of evergreens. Dwarf roses, on the other hand, if enclosed by evergreens so that they do not get sufficient air, are usually unhealthy and produce few flowers.

Points which the amateur should consider particularly when planning his little front garden are these:—

- 1 To create a pleasant appearance from the road;
- 2 To create an inviting appearance to those entering from the road. (Fragrant flowers alongside the path or between the cracks of the paving will assist here.);
- 3 To provide easy access to front door and side door *without any encouragement to tradesmen's boys to cross the grass instead of using the path;*

PLANNING THE GARDEN

- 4 To create a pleasant picture as seen from the house windows;
- 5 To plan a garden that will be easily kept in good order. It is particularly essential that the front garden should be neat at all times.

PASSAGES BETWEEN HOUSES

One of the problems that the amateur gardener frequently meets is that of treating side passages that connect the front and back garden, in order to bring them into the æsthetic theme of the whole. As a rule such passages are draughty and rather cold and sunless. The first thing to do if they are to be beautified with growing plants is to provide some sort of screen to prevent cold winds whistling down the passage.

A few of the hardier evergreens carefully placed at each end of the passage are sufficient to break the force of the winds. If the passage is a paved one it can then be beautified by standing tubs or boxes along it, in which are grown such shade-loving plants as Funkia, Solomon's seal, ferns, and possibly ivy or creeper to clothe the wall and fence.

THE GARDEN USEFUL

Most gardens, even if they are small gardens, can be made to produce something for use in the kitchen. If they are small sunny patches, a little herb garden may be arranged, even where there is no room for a proper vegetable garden. Kitchen gardening can be divided roughly into three groups: the cultivation of herbs, vegetables, and fruit.

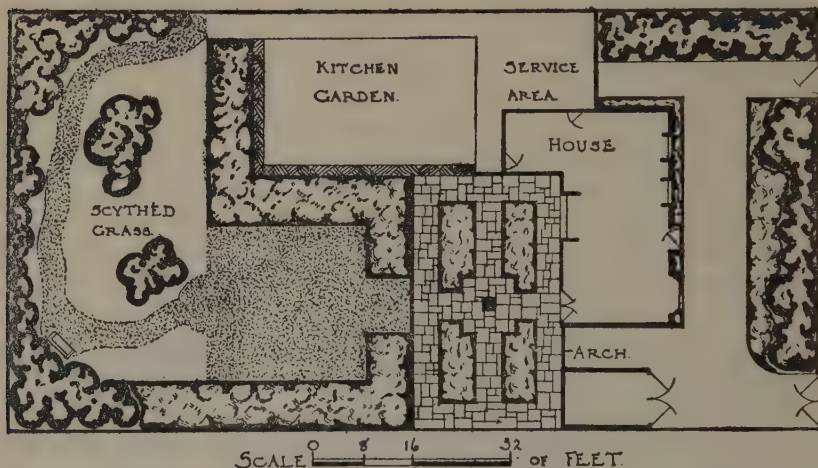
The herbs and the fruit can be included as part of the flower garden, where space is limited; but where any vegetable crops are grown, it is generally wisest to allot a special portion of the ground. In the average rectangular garden, the general design adopted by hundreds of thousands of builders all over the country, is probably the best for many reasons. The design referred to is that of a small lawn immediately at the back of the house, surrounded by flower borders, with a pathway leading through a rose arch to a vegetable plot in the extreme rear. The archway breaks the line of vision sufficiently to screen the vegetable plot, which is, of course, not so ornamental as the portion devoted to flowers.

During the Great War, when special attention was given by small householders to the cultivation of vegetable crops, many schemes were tried out with the idea of combining beauty and utility. Archways were covered with runner beans, and marrows and pumpkins were grown as ornamental climbing plants over fences and pergolas. Ordinary flower borders were planted with edgings of carrot and beetroot. But it must be confessed that this attempt to combine the æsthetic and the utilitarian was not wholly successful. Clean cultivation, manuring specially adapted to each crop, and the quick growth and harvesting of the crops, are essentials for the success of the vegetable plot, and these can only be

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achieved easily and economically where a special portion of the ground is reserved for vegetables only.

At the same time if the vegetable garden is well arranged, it can be much more attractive than is the average allotment. There is no reason why the path edges should not be planted with flowers, so that the glimpse of the vegetable plot seen down the length of the garden is colourful.



The man who can spend only week-ends in his garden should study this layout. The paved rose garden, use of trees and shrubs and a small mown grass area help to save labour. The remainder of the grass area could be cut about twice a season

St. Brigid Anemones make a fine permanent edging to small vegetable plots, or if a permanent edging is undesirable, parsley or pot marigolds can be used.

In arranging the vegetable garden, points to consider are as follows:—

- 1 The ground should be open to the sun and air, but sheltered on the north and east side, if possible, from keen winds;
- 2 The plot should be easily accessible from good strong paths, serviceable enough to be used for the wheeling of manure and crops;
- 3 A rectangular plot is the best for cultivating most vegetables, so that they can be easily grown in parallel lines, and these lines should run north and south;
- 4 The plot should be level, or only very slightly sloping towards the south;
- 5 Paths should be made of soil, gravel, cinder or paving stone, but *not* of grass, as grass harbours many insect pests which would be troublesome;



A well-planned formal garden, in which the flowers are sheltered by a thick hedge. The trees and shrubs in the background make a good setting for the seat which overlooks the garden

Photo: Suttons



1. A sundial is always in harmony with a planted, paved pathway

2. Curved steps make pleasing means of descent from a terrace



2

3. This broad grass terrace is designed to be in proportion with the height of the house as seen from below the steps



3

4. A paved sunken garden can be filled with flowers at all seasons and is easy to maintain



4



*A formal path and in places can be planted with just a few uniform plants. The main planting, however, is best kept at a distance
 Photo Suttons
 Irises of all kinds is a happy thought for the borders*



1. Formal beds in grass are charming massed with summer flowers.



2. Formal beds are here set in gravel and surrounded by a Box edging. They would be effective planted with Tulips for an early display.



Photo: Carters
With an interest in the garden, it formed with a view to the garden. The garden is a garden of the garden. The garden is a garden of the garden. The garden is a garden of the garden.



1. Informal paving here surrounds an informal pool. A sundial and dwarf planting is in keeping with the treatment

2. Simple slabs of stone can be used to form rough steps in the rock garden

3. A paved path can be flanked with lavender and other scented plants. A seat is happily placed at the end of the walk





A simple stone sundial here gives added interest to borders ablaze with summer flowers

1. *R a n d o m
square paving
gives a digni-
fied pathway*

2. *Bricks can be
used in various
ways to make
pleasing path-
way designs*

Photo: Haunchwood
Brick and Tile Co.



2



3. *Odd pieces of
paving make a
path suitable for
the rock garden.*

4. *Stepping-stones
used so as to
give a dry walk
across grass*



Photo: Carters



1. A wild corner of the garden planted with *Spiræas*

2. A bold clump of *Irises* makes a fine display on the edge of woodland.



3. Large flagstones make a most satisfactory pathway through a bog garden



1. The severity of stone walls and clipped yew hedges can be softened a few alpinas in the stonework

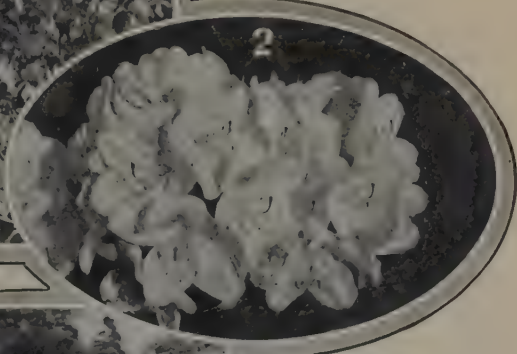
2. A dry wall can be made an interesting feature in the garden



3. Formal terrace walling is greatly improved by the use of a few alpinas



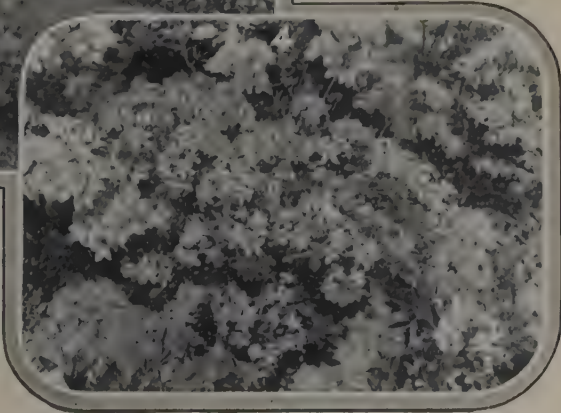
1. *Rhododendron John Waterer* is a fine red variety



2. *Mrs. George Paul* is a blush-coloured *Rhododendron*



3. Bold clumps of *Azaleas* and *Rhododendrons* in grass make very effective garden pictures



4. The fragrant *Azaleas* should be included in every garden scheme for the bright colours they give in spring



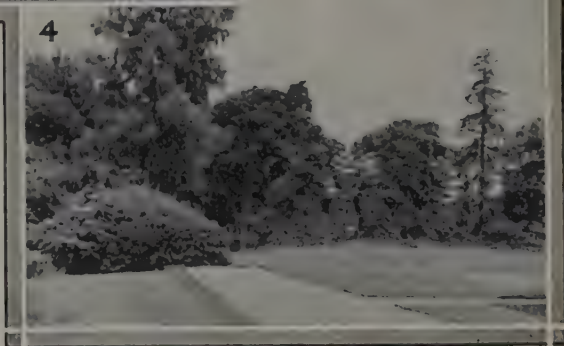
1. A heather garden, if planted in variety, will give bloom through most months of the year



2. Evening Primroses grown in a bold clump in some odd corner of the garden will give unexpected fragrance after sundown



3. Various conifers can be used to give colour contrasts



4. The different habits of growth of shrubs should be considered when planting

Photo: The Hortiphot Co.



1. *Polygonum Baldschuanicum* is a rampant-growing climber which will smother the roof of a summer-house in two seasons

2. *Lathyrus*, the everlasting pea, is a useful climber for covering trellis. Its red or blue flowers are very effective

2



3. *Clematis* are some of the most useful climbers for gardens. They like their flowers to be in the sun and their roots in the shade

3



4



4. *Lonicera* or Honeysuckle, with its scented, creamy-red flowers, can be planted near buildings



1. A summer bedding scheme which includes *Antirrhinums* and *Gladioli*.
2. The large-flowered *Gladioli* should be scattered over the bed and planted where they fall between the *Antirrhinums*. Photo: Bath Ltd.
3. A dwarf *Antirrhinum*, *Golden Bells*, which makes a fine bedding plant. It is yellow, buff, and terra-cotta in colour.



Photo: Carters

1. Brightly-coloured Darwin Tulips on their long slender stems are ideal for garden decoration
2. Narcissus can be planted innumbly in grass to brighten the garden in spring
3. Single and double Narcissus are here shown naturalized by a streamside

1. *Daphne* is a small, fragrant, spring-flowering shrub



Photo: Dobbie & Co.



2. *Golden Gleam Nasturtium*, the fragrant yellow annual, makes a fine show in the garden and will grow very well in town



3. The *Viburnum* or *Snowball Tree* has white flowers. It should be planted in a border with a dark background, so that its full beauty can be enjoyed

PLANNING THE GARDEN

- 6 No trees should be allowed to overhang the vegetable plot. It is possible to grow vegetables between newly-planted fruit trees for the first few years, but when the trees become large, vegetable crops will not be a success.

THE HERB GARDEN

Herbs are often grown in a part of the vegetable garden, but the gardener who has an odd-shaped plot to lay out, may find it convenient to grow them in a small corner of the garden by themselves. A herb garden could be designed as a very small formal garden, using lavender, sage, marjoram and other perennial herbs for the main planting of small beds, while other beds can be planted annually, with pot marigolds, summer savoury, parsley, etc.

An old-fashioned sundial, or a seat with a quaint old-fashioned inscription, could complete the design of such a herb garden, which makes a fitting link between the flower garden and the vegetable plot, or orchard.

THE FRUIT GARDEN

If a garden is large enough for a section to be devoted entirely to fruit, the position of the small orchard should be decided at the time the whole is laid out. It should be remembered that the taller trees in the orchard make an effective background, and in a small plot the proper place for them will be at the far end or along the sides.

Standard trees are of most use from an ornamental point of view, and have the advantage that bush fruits can be grown beneath them for many years after they are established.

The best position for a fruit section of the garden is on a slight slope towards the north or west, and preferably on the highest part of the plot if there is a choice. Frost is more dangerous in the valleys than on the hillsides, and the most damage is done by frost in the early morning when sunshine thaws the hoar frost on frozen flower buds too rapidly. That is why a position where the early morning sun does not reach the trees is generally the best. If the fruit section of the garden is large enough to be enclosed by a high wall, a far greater variety of fruit can be grown, as peaches, nectarines, and apricots can be trained on the wall that faces south, while fruits of other kinds can fill the remaining walls. The actual arrangement of the trees and bushes depends entirely on the kinds of fruit to be grown, and must be considered in connection with the advice given elsewhere concerning the various fruits suitable for the small garden.

THE LAWN

The part of the garden immediately behind the house is of great importance. This is usually devoted to flowers, and is often used in summer

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as an outdoor room. It is therefore advisable, where possible, to set aside a portion of this ground for a lawn. The lawn is typically English, and should be a special feature in every garden. It must be remembered, however, that if a lawn is not kept neat and tidy it looks quite unsightly, and unless constant care and attention can be given to it the lawn should be restricted to a very small area.

When making a lawn, the order of the work is as follows:—First of all, the lie of the land is considered and, if necessary, drainage pipes are laid to ensure the disposal of any surplus water. If the ground is not level, the top soil is taken off, and the levelling done on the subsoil. Then the top soil is replaced evenly over the level surface. This is essential because, as already mentioned, the top soil is always the most fertile. (For further details, *see* CHAPTERS II and XV.)

FORMAL GARDENS

If a garden of formal design is desired, it should always be a complete unit, that is to say, either the whole garden should be formal, or if the garden is large enough to allow of both a formal and informal garden, they should be separated by some suitable hedge or division. This can be a low stone wall or a hedge of small trees.

An amateur will often like to specialize in a certain kind of flower, and these specialist gardens often take on a formal design. This type of garden should also be a complete unit. Unless care is taken over this point the beauty is often marred.

Before the specialist garden is decided upon and arrangements have been made, it is necessary to consider the requirements of the plants to be grown. Roses, for instance, like rich loam of stiff mixture, and not poor sandy soil. Rhododendrons would grow on sandy peat, and a good heather garden could be made on thin sandy heathland.

WHERE TO MAKE A ROSE GARDEN

Our national flower has inspired many amateur gardeners to devote a part or sometimes the whole of their gardens to the cultivation of roses only. The reasons are not entirely sentimental.

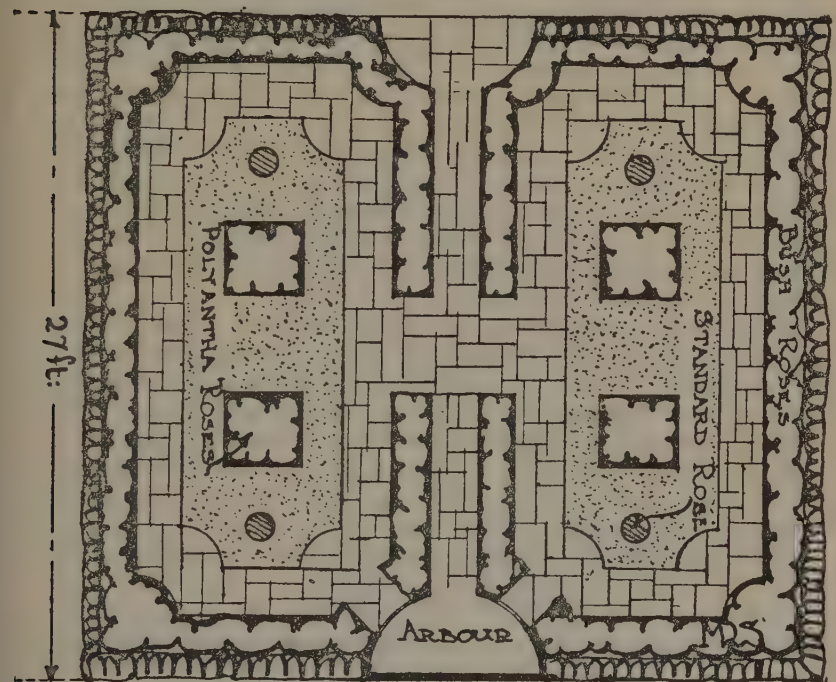
Roses display to better advantage in a garden of their own than mixed too freely with other plants. Also, because they like a free circulation of air among the stems, they are unhealthy in company with luxurious herbaceous plants which make thick masses of leaf growth. Roses associated with such plants rarely flourish.

The preference for a free circulation of air round roses suggests that the highest part of a garden site should be selected for the rose garden, and as a matter of fact excellent rose gardens are made on seaside cliffs exposed to ocean breezes.

PLANNING THE GARDEN

The rose has so many varieties, both of colour and form, that it is useful for many purposes, from beds of varied colours to the roseway or pergola. In designing a rose garden, the question we ask ourselves is what we expect from this feature. In the first place, the rose garden must be ideal for the cultivation of roses of all kinds.

It will not be possible in a small garden to grow many varieties;



Bush roses are grown in the square beds set in grass and polyantha varieties in the narrow beds surrounded by paving

but it will probably be thought desirable to plant a few bush roses, standards and climbers. Provision should be made for each.

The most important point is that the rose gardens must present a pleasant picture. Perfect roses are grown on allotments, but they do not turn the allotments into rose gardens.

It is doubtful whether a good rose garden could be made which entirely ignored the formal type of design, but there are, of course, degrees of formality. Probably the real reason for formality in the rose garden is that it assists the gardener by making small beds possible. This gives easier access to the plants at all seasons, and eases the work of pruning, cutting and manuring.

COMPLETE GUIDE TO HOME GARDENS

Other charms we hope for in the rose garden are colour contrasts and harmonies. For this, some knowledge of roses, their colours, habits of growth, and particularly the colour of their foliage, is needed.

Having decided what we want in our rose garden, the next step is to fit these into a scheme which will suit the site at our disposal.

If it is specially desired that standard roses should be grown, they can be placed in beds among the bush roses. The water of a pool reflects their beauties in remarkably good manner, and standard roses, particularly weeping standards of the climbing varieties, are lovely grown in narrow beds at the far end of a pool. Water might therefore be associated with the rose garden.

No rose garden is complete without the inclusion of some of the climbing varieties, and now that the hybridist has created such a wonderful variety of shades among this group, as much use as possible should be made of them. A semi-circular rose trellis set against a background of trees and shrubs, and covered with roses of scarlet, yellow and cream, makes a particularly beautiful effect.

Pathways in the rose garden are always a matter of taste, but whenever it can be arranged, grass should be liberally employed. Nothing sets off roses to better advantage than the green of a lawn or grass walks, and they are well worth the trouble of maintenance.

Stone paths can also be introduced, the object being to provide a dry footway in showery weather. A combination of stone with grass verges is both lovely and serviceable, but the work of trimming the grass becomes very exacting.

For further details of Rose Gardens, *see* CHAPTER VIII.

IRIS GARDENS

It is generally not advisable to specialize in irises if the garden is not very large, but if there is an odd-shaped corner of the garden, Irises may be grouped there. These are useful where there is no grass, for they display well near paths of flagstones, or similar material. Iris gardens are not very often included in the small garden design, and are usually reserved for the large estate of several acres.

DIANTHUS GARDENS

In a position where high winds cut across the garden, carnations and pinks may be grown with safety. They will grow in any fairly light soil where drainage is good, or in heavier soil if well prepared and limed. It is essential that carnations are not overshadowed by tall trees, and they must have all the air and light possible. A formal design, in which stone is employed, is in keeping with the plants of the *Dianthus* family, and is generally used for a specialist garden of this type.

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ROCK GARDENS

Some gardeners prefer to specialize in rock and alpine plants. This entails the making of a rock garden, which can be worked into the mixed garden design to add considerably to its picturesque effect as well as its horticultural interest. In making the plan, the rock garden should be allotted a sunny open site, not overhung by trees. Shaded rockeries are unsuitable for anything except the cultivation of ferns and a few similar shade-loving plants. (See also CHAPTER IX for Rock Gardens.)

THE GARDEN ROUND A BUNGALOW

There is, or should be, some difference between the type of garden that is appropriate to a small house, and one that is suitable for a bungalow of the same size. In the one case, though the kitchen quarters may with advantage be lightly screened so that they do not obtrude on the restfulness of the garden, there is no need for strict privacy. In the case of a bungalow, bedrooms and bathrooms are on the ground floor, and it is a first step in garden planning to create barriers between them and the garden. This does not mean that the bedrooms should be shut in by high screens and hedges, or darkened by tall thick shrubs and trees. Nor does it mean that their outlook should be robbed of all garden beauty. Those who have lived in bungalows know that they are ideal for invalids, largely because they bring the garden to them, as it were, through open doors and windows. So the plan of the bungalow garden should be made with this in mind, and special pictures should be arranged in full view of the bedrooms as in the case of the living-rooms.

Take, for instance, a small bungalow with a bedroom on the side where there is a tradesmen's entrance. The first point to be considered would be the privacy of the bedroom, and for this reason, the path that approaches the kitchen door would be, if possible, a straight one that does not pass too close to the window. *Straight*, in this case, because to curve a path in order to take it away from the window would defeat its own object—tradesmen would tend to take the shorter cut over grass or border! Between the path and the window either a strip of turf, or a bed of dwarf shrubs and spring bulbs would be sufficient to keep the windows from a too-penetrating inspection.

Alternatively, the window could be rendered still more private by the erection of a light rustic screen about four or five feet away, to which could be trained a fan-shaped cherry, or roses, according to aspect. Behind the screen there might be a narrow border containing ferns, spring bulbs, or if sun is plentiful, scented annuals.

The bungalow garden design must of course include the use of shrubs and trees, but extra care is needed to see that these do not overwhelm

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the low-roofed building. Dwarf conifers as specimens on the lawn are the best kind of tree or shrub to use near the building, though fruit trees which are not either too heavy, or too tall, are almost as good, perhaps better in some cases.

Vistas assume supreme importance in the bungalow garden. The complete layout of a garden is, in the case of a house, generally best seen from the upper windows. In a bungalow the only way in which a comprehensive view can be obtained is through vistas, which should suggest the character of different sections without making them too obvious. This means that a vista will show a view beyond the lawn to a rose garden, and further still to a water garden, but it should not be possible to see the whole of these features without passing down the path. In other words, the vista should be an invitation.

THE TERRACE IN GARDEN DESIGN

The terrace is a feature which can be included in a more or less modified form in any garden, whether that of the house or the bungalow. It is far more suited to the house of limited proportions than is generally recognized. Formality is bound to exist in the architectural lines of a house, and in order to form a good link between house and garden, which is one of the secrets of good garden design, these lines should be extended in that part of the garden that is nearest to the house. A terrace makes use of these lines in a charming manner. By its creation, a view is obtained across the plot which can be admired at leisure, since there is room on a terrace for several persons to stand, or sit, together.

Except in the rare cases where the garden slopes upwards from the house, a terrace, or the effect of one, is always an additional feature of charm.

Whether the terrace is raised above the general garden level, or merely a paved portion near the house, bounded by a formal stone balustrade, or hedge, and designed chiefly to give a clean walk along the garden side of the house, the important points are the same. First, there is the question of size, by which is meant chiefly the width, for most terraces extend the whole length of one side of the building. In a small garden, where the terrace is simply a dry walk, it need only be from six to ten feet wide. Where flower-beds form a part of the scheme, more width is needed. It is very important to keep to sensible proportions, that is, not to make the paved terrace too large for the house, nor too small, so that it looks mean and insignificant. The best way to avoid either pitfall is to peg out the area first, and study it in relation to the house and other features.

The width of the terrace is to some extent dictated by the lie of the land, and this also affects the choice of balustrade. Anything may

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be used, from massive stone balustrading to simple oak posts covered with ivy or other plants. Living hedges are also possible, though these should be close clipped or dwarf shrubs—Box, Lavender or Veronicas, for instance.

WALL FOUNTAINS

Below the balustrade of a terrace, a wall fountain finds a suitable place. A fountain of this kind, with a semi-circular dripping pool below, approached from the terrace by twin stairways, is a device that is very popular in gardens of certain types. A simpler design would substitute a grassy bank or dry retaining wall as a division between the two levels. Of these alternatives, the grass banks are most troublesome to keep in order owing to the difficulty of trimming, and walls are more common in consequence. A nearly vertical wall, with a stout balustrade at the top, is most practical where the difference in level is very great between the garden and terrace.

If grass banks are made, they should rise one foot for every two of horizontal breadth, any steeper slope being too ready to dry out during the summer.

Slight differences of level are best divided by dry retaining walls, planted with colourful rock plants—Aubrietias, Arabis, Pinks, Stonecrops, and Ferns. At the base of the dry wall a narrow border is better than if a grass lawn runs right to the rocks, since it is not possible to cut grass close to the wall with a mower.

TERRACE STEPS

By a variation of the steps, much ingenuity can be introduced into the design of a terrace. Straight steps from the centre are noble and dignified where a mansion and grounds are being treated. They are less pleasing in the little garden. Solid stone steps, with stone vases (or lions) and formal balustrades, are out of place in most amateurs' gardens. Where they are introduced, they should have five- or six-inch risers, and thirteen- to sixteen-inch treads. Where more than ten steps exist, a landing is advisable. A two-inch nosing and two-inch coping is generally used throughout.

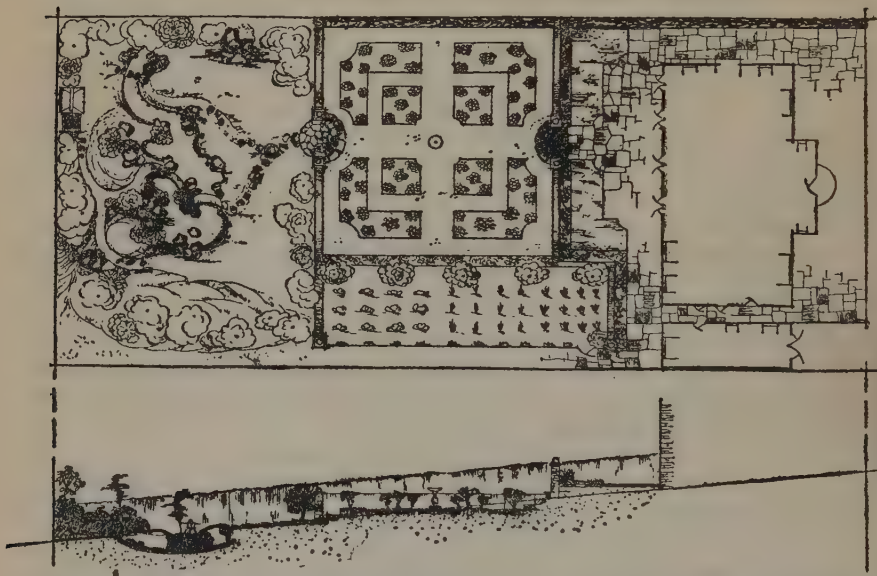
But in small gardens, a circular landing where a seat can be placed, or a pair of twisting twin stairways, or ornamental tiled or bricked stairways, or hidden stairways disguised by creeper-covered screens, are types preferred to the heavy formality of stone balustrades and central stairways.

BEDS ON THE TERRACE

Small beds are sometimes included in the terrace layout. These must of necessity be rather formal, and should be planted with formal

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compact plants—bulbs in spring, tender bedding plants in summer, and Christmas roses in winter, for instance. The beds must not be too large, and ample space for walking round them is essential. Such beds are only to be regarded as “trimmings”; they are not an essential part of the garden planting scheme. The main object of the terrace is to be a viewpoint from which the garden can be appreciated. That is why any design must include one or more seats, placed either at the ends, or facing central steps, or on the stairway landings.



A sloping garden can be made very pleasing by means of a series of terraces. In this design, a formal rose garden and vegetable plot are accommodated on the second terrace and an informal rock and water garden on the third

A SERIES OF TERRACES

A very steep slope on a garden site opens up the possibility of making a series of terraces, each divided from its neighbour by a retaining wall. Steps leading from one to the other will usually be a little less formal than those leading from the house doors, and their sides can well be planted with creeping subjects—Periwinkle, Pinks, Arabis, Thymes, etc.—while the balustrade may be omitted altogether.

Such terraced gardens suggest the use of each level for a different purpose. On a long gradual slope, the second terrace may be at a considerable distance from the house, and may be used perhaps as a games lawn. The players can then be watched from the upper terrace. A

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smooth, green games lawn does not shorten the vista as vivid carpet bedding does, if placed in the middle distance.

A series of terraced levels is of course very suitable for the garden which slopes upwards from the house. In such a case, the garden shelter can be placed on the highest terrace, where it will command a view of the whole garden, and also make a decorative feature seen from house windows.

GREENHOUSES AND FRAMES

So far nothing has been said about the position of greenhouses and frames, sheds, and rubbish "dumps," which are so often the cause of failure in garden beautification. Of the really unsightly sheds and dumps all one can say is that they are best placed out of sight; that is, surrounded by a high hedge or screen. The greenhouse should not be an eyesore. It ought to be made beautiful both in design and ornamentation, i.e. externally and internally. Properly managed, a greenhouse can be colourful all the year round, and certainly the side on which one approaches it should be kept gay with bright pot plants.

For utilitarian purposes a greenhouse is best erected in the warmest, sunniest part of the garden, so that the minimum of artificial heat is needed. It should preferably be a span-roof structure, running north and south, with the door at the south end. As this subject is dealt with in Chapter XIII, however, it is unnecessary to say more at this point, except to stress the fact, that, given good architectural lines, and good cultivation, the greenhouse can, and should be, an asset to the garden artist, and should form an integral part of the garden design.

CHAPTER II

COST AND MAKING OF PATHS—PEGGING-OUT THE PLOT—
LAWN OUTLINES—FENCES AND SCREENS—MATERIALS FOR
PERGOLAS—DRAINAGE.

GARDEN CONSTRUCTION

UP to the present we have merely been browsing amongst various possible designs for the home garden. Actually no definite decision can be taken regarding them until the question of materials has also been considered. Most of us have somewhat limited purses, and quantities and costs enter largely into the design of our gardens. Let us take each section in turn.

PATH COSTS

When a builder leaves a plot entirely undeveloped, without paths of any sort, the first practical work which every householder will want to do is to make clean, dry, service paths. The size of these naturally depends on the purpose for which the path is to be used. Four feet wide is a minimum for the main path of the flower garden, and ten feet a minimum width for a carriage drive.

Costs vary almost from day to day and to quote the exact cost for any type of garden path would of course be absurd, since the materials available vary according to the district, and the distance over which they have to be carted, but it may be of some help to those who are planning their gardens to give a few approximate costs, for comparison. Assuming that a path is four feet wide, and twenty feet in length, and that the site has already been excavated, levelled and dressed with cinders, ashes, or gravel (preparation that is necessary with all types of paths), the cost of different surfacing materials would be approximately as follows:—

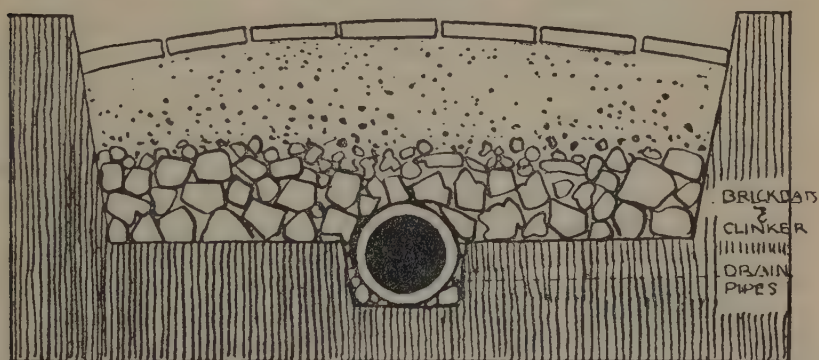
Random paving, 9 sq. yards	.	.	.	.	.	40/-
Bricks, 400	.	.	.	.	.	30/-
Crazy paving, 9 sq. yards	.	.	.	.	.	30/-
Tarmac, one ton	.	.	.	.	.	25/-
Gravel, one load	.	.	.	.	.	20/-
Grass (from seed, including a little fertilizer to hasten growth)	.	.	.	.	.	5/-

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Path Construction.—In making a carriage drive, the first essential is to excavate the soil so that some sort of good drainage material can be used as a foundation. If only occasional traffic is to pass over the drive it will be quite sufficient if a six-inch layer of clinker or chalk is put below some gravel. This will be well rolled before the gravel is laid, and the gravel will be sifted before use and the finest portion reserved for top dressing.

Paths should be made with a slight camber, that is to say, the centre portion will be an inch or two higher than the sides. This will encourage the rapid drainage of surplus water, and prevent the path becoming soggy in bad weather.

It may be desirable to put in one or two side drains, or if the site



If the site is at all waterlogged drainage should be considered when making a pathway. A slight camber will help to disperse water

is particularly difficult, it may even be necessary to put in a drainage pipe along the centre of the drive.

As each layer of clinker, gravel and fine sand is laid, the drive will be well rolled, watering it at the same time if the weather is very dry. A tarred surface over the whole considerably lengthens the life of the drive, since it ensures the rapid disappearance of water. Tar has to be applied hot, however, and the up-to-date gardener uses a bituminous preparation which can be applied cold, and which is just as effective as tar. There are several of these preparations on the market, and they are well worth their cost because they save the expense of repair in after years.

Over the top of the dressed path a little fine sand or ashes may be strewn, to improve the colour of the drive. All this work can be undertaken even by an inexperienced amateur in any ordinary garden.

Gravel paths in the flower garden are made exactly the same way,

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that is, with an underlayer of clinker or rough stones, topped with gravel, and surfaced as already suggested.

Paved paths are, however, even more picturesque than gravel, and if the cost of paving is not prohibitive, they are to be recommended, because of their greater durability. Whether the paving is rectangular, or of crazy pattern, is a matter of personal preference. The secret of success in making paths of this kind is to lay the paving dead level. The path is otherwise made precisely as the gravel path, over a layer of rough material.

If a path is to be straight and flat it is as well to drive in a few pegs at intervals along each side of the length reserved for the path, and to test the surface of the paving stones by placing a board across each pair of pegs and using a spirit level.

Crazy paving should never be laid entirely in cement, though cement may be used between some of the stones, while soil cracks are left here and there to be set with carpet plants. A perfectly safe and even path can be made if the paving stones have a level surface, and if they are laid accurately. A subsoil of clinker is recommended here as for the gravel paths, so that good drainage is ensured. Over this, a little fine soil or sand is spread evenly and the paving stones then put into position. A board is used as straight-edge to test the evenness of the surface.

Between the cracks of the paving stones (where cement is not employed) a good soil mixed with sand should be rammed, the stones being made very firm, so that they do not move when trodden on. Tiny plants are, with advantage, set at the same time as the path is laid, or seeds of suitable plants (such as *Cotulas*) can be mixed with the soil put between the stones. In a very short time such a crazy-paved path will assume an old-world appearance.

An alternative to the crazy pathway or the more formal path of rectangular flagstones, is one of ornamental tiles or bricks. Extremely decorative paths can be made in these materials which are useful in a very tiny garden, especially a shady town garden, for the colour in the paths to some extent compensates for lack of colour in the flower borders.

The bricks can be used in various patterns, herring-bone, or any other desired fashion. Several suggestions will be found in the diagrams given, and other designs will be worked out from these by the ingenious garden-maker.

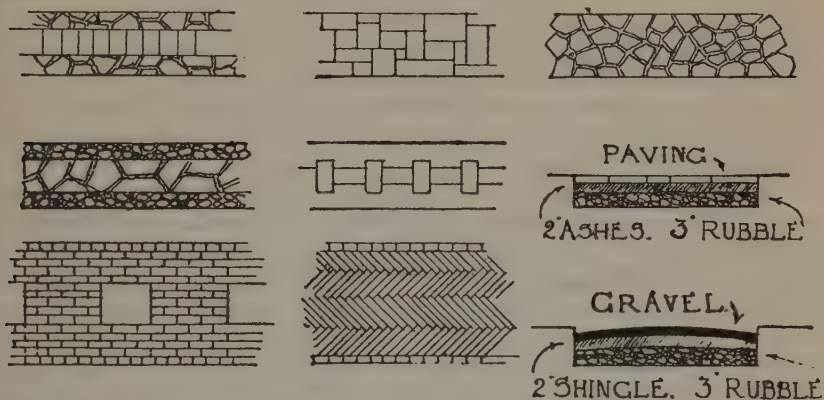
Grass paths are made exactly in the same manner as grass lawns. They are perhaps the finest of all settings for flowers, especially for roses. But a grass path is quickly worn bare if it is constantly in use, and it is, of course, quite unsuitable as a service path where a heavy wheelbarrow may have to pass along it in rainy weather. A very happy idea is to combine grass with flagstones, tiles or bricks. Rectangular flag-

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stones placed alternatively lengthwise and breadthwise along the centre of a grass path make an attractive feature in any garden, and have the advantage of creating a clean pathway usable at all seasons, while the severity of an entirely paved walk is softened by the grass edges.

The essential thing is to arrange good drainage, and to raise the centre of the path *very slightly* above the sides so that rain never collects where the path is most trodden.

In the case of sunk pathways, where there is great danger of water collecting, side drains should be arranged with small gratings at intervals through which the surplus rain will quickly pass.



Pathways can be made of various design, using one material only or a combination of materials

Across the vegetable plot, a simple rolled soil track may be sufficient in some places, or a path covered with a clinker or gravel or household cinders or ash can be made; but as already suggested, paths of this kind should not be clearly visible from the pleasure garden.

Path Edges.—An important point for the one-man gardener to consider is the treatment of the path edges. Grass verges need constant attention if they are to be kept neat and tidy, and a broken outline, or ragged overhanging grass, becomes at once unsightly. It is also a source of danger to the border, since long grass at the edge of the path harbours slugs and other soil pests. Generally speaking, therefore, in the strictly amateur garden, grass edges are best avoided and some form of permanent edging used instead.

A grass path, if it is specially wanted, is best edged with flat pieces of stone let into the grass with their straight edges along the path side. This method allows the use of the mower along the centre grass portion of the path and obviates the necessity for trimming the edges.

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If the border edging plants, such as Pinks, do encroach a little over these flat stones, no harm is done; in fact, the outline of the path is softened and improved by such vagabonds from the border, and the severity of a formal garden is tempered without destroying its formality.

A still more formal edge can be made by the use of ornamental tiles, but this will be less attractive than if the border plants creep slightly over the edge of the path. Wood edgings between the border and the path should not be used, even if the wood is treated with preservative. It will in time decay, and form a source of trouble. Moreover, the use of tar and similar preservatives on the wood make the edge of the border unhealthy for dwarf plants. Bricks are sometimes used, but the amateur is warned against the use of bricks set with points upwards like an even row of teeth! This type of edging has been overdone, and is now generally regarded with disfavour. It is far better, if bricks are to be used, to lay them lengthwise, straight along the edge of the path. Even then, the appearance will be improved if the border plants are allowed to roam over the bricks.

First Steps in Lay-out.—When the new gardener has planned his garden, more or less on paper, and intends to begin the work of laying out his plot, he is sometimes at a loss how to proceed. The garden as left by the building contractor often presents a sorry spectacle. It is possibly smothered from end to end with rough heaps of sticky clay, and all kinds of rubbish. Perhaps an unsightly cement patch in one corner, and a number of old tins in another. The first step is obviously to clear all this away, and stack the hard rubbish together, for use as path foundations.

The next step is to find out whether the garden level has to be altered in any way. If it is intended to make a sunk garden, the necessary excavations are best made immediately. Otherwise lawns and paths may be damaged during the removal of heavy loads of soil.

Pegs, that is, pieces of wood from a foot to two feet long, pointed at one end and flat at the other, are used for levelling. They are driven into the ground at important points, for instance, at the corners of the lawn, and at the junction of paths, etc., etc. Levels are then tested by laying a straight-edge of board from peg to peg and using a spirit level, which costs a few pence.

The garden-maker can take his choice over the boundary of the sunk garden made on a slope, when he discovers how much difference in level exists in the first place. A high wall can be made at one end, to match the opposing retaining wall, or some of the soil removed from the site can be banked round the lower end to make the banks of even height all round. The easiest way is to leave the surrounding ground undisturbed, and merely to level the sunk portion, testing its new surface with the

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straight-edge and the spirit level. Differences in height of the surrounding walls do not adversely affect the formality of the sunk garden, or the beauty of its treatment.

FENCES AND SCREENS

The next thing to do is to consider boundaries. (In some cases this will be the first step, but it is strongly recommended that the site be roughly levelled as desired, and a few pegs driven in to outline the main features beforehand, partly because soil removed can sometimes be used advantageously to make a shelter bank behind newly-planted hedges.) It is unnecessary to peg out a garden entirely before a hedge is planted, and if there is unlikely to be much alteration in levels, hedge plants are best put in as soon as possible, as they will sooner become established.

The most popular form of boundary is an evergreen hedge, and fuller details concerning these is given elsewhere. It is worth remarking here that good ornamental flowering hedges are not expensive if regarded as a substitute for artificial fencing.

Modern types of artificial fencing are extremely valuable, because they provide a screen immediately, but they do not furnish the garden in the way that a green hedge does. However, where it is necessary to put up a boundary quickly, that will form a complete screen; the modern woven board fencing will be found decorative from the moment of erection, and very serviceable and long lived.

Comparison of the prices of different materials for boundaries are given below, with, of course, some reservation as these prices fluctuate a little from time to time:

Woven board fencing, run of 18 ft., 4 ft. high . £2 approx.

“ “ “ “ 18 ft., 6 ft. high . £3 “

“ “ “ “ 18 ft., 8 ft. high . £4 “

(complete with posts and top rails).

Wattle Hurdles, run of 18 ft., 6 ft. high . £1 approx.

“ “ “ 18 ft., 4 ft. high . 12/6 “

Chestnut pales. Run of 18 ft., 4 ft. high, from 10/- up.

The erection of screens of various kinds between one garden and another, and between one portion of a garden and the next is another of the items to be dealt with early in the layout of the garden. Every screen should serve a direct purpose, and should be a picturesque background as well as a division fence. Screens, like boundary fences, can be either living or artificial, that is to say, a good boundary could be made between one section and another with plants only.

For the moment, we are concerned only with the erection of

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artificial material, such as stone, brick, wood, etc. This material should harmonize with other features in the garden, and if there is any choice, preference should be given to the type of screen which will gain beauty with age. For instance, a sturdily-built trellis of square design (squares of any size from 2-12 in.), over which suitable climbers are grown, will be more beautiful each year.

Rustic screens, unless the wood is of lasting quality, are likely to collapse just when the climbing plants are reaching the height of their glory. So much depends on the purpose to which the screen is to be put, that there is plenty of variation in connection with this feature. If the screen must absolutely hide whatever is behind it, as in the case



For dividing one part of the garden from another a trellis gateway gives the necessary boundary without obstructing the view

of a screen in front of an unsightly shed or compost heap, it must be of fairly close type.

There are an immense number of easily erected screens on the market from which the gardener can choose, where expense is no object. These designs can be more or less copied by the home carpenter at considerably less cost. The essential thing to remember in erecting any sort of screen is the stability of the posts, coupled with the durability of the material. The posts used should penetrate to a depth of 2 ft. into the soil (for a high structure) and the part below the soil surface should always be treated with some sort of preservative. Above the ground the wood can be left untreated if it is oak or teak, or treated with creosote if it is of a softer kind.

LAWN OUTLINES

The detailed method of lawn making is described elsewhere, but the size and type of the lawn should be considered with the general

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layout. If the soil where the lawn is to be made is very waterlogged, arrangements should be made for draining it before the rest of the garden and borders are laid out. Otherwise difficulties will arise.

When a lawn is being made for ordinary use and not for games it is found useful to make the edges undulating rather than straight, particularly where there is only room for a small lawn and a surround of flower border. Straight edges are very effective if they are really straight, but they need constant attention in this matter. By curving the edges of the lawn, however, parts of the border are brought forward, and create a more picturesque effect, and at the same time the gardener's work is considerably lightened, since he does not have to trouble about the accuracy of the line when he is trimming the edges.

Formal Beds in the Lawn.—If a formal bed of geometrical design is to be made, the outline can be marked by using two sticks with a line of string drawn taut between them. One stick is driven into the soil and the other is used to determine the outline of the beds. All kinds of beds with all manner of curves can be made, the outline being drawn in precisely the same manner as when compasses are used on paper.

The most common difficulty where a novice is making a bed of this kind is in cutting out an *oval*-shaped bed from a lawn. This can easily be done by the following method. Place two stakes in the ground say eight feet apart. Take a piece of string eighteen feet long and tie the ends together. Put the string over the two stakes and then take a sharpened stick and place it in the loop of the string, pressing it outwards. Move this round the radius allowed by the taut string, marking the surface of the ground. A perfect oval, ten feet by six feet, will be formed.

All formal designs of this kind require constant attention and accuracy, to be kept in good condition, and the amateur is advised to make his garden *more informal in design if labour is likely to be short*.

In a very small garden, where most of the space is devoted to lawn and flower beds, a dry walk (which is essential where washing has to be dried) can be made by laying stepping stones into the lawn. For this, rectangular flagstones are ideal. An efficient substitute for paving stones of this description can be made with cement, using 1 part cement to 2 of sand. The best way to make these is to run the cement into a shallow wooden framework, or a shallow box about 3 in. deep. Flat-surfaced stones made in this way are very easy to lay. The distance apart should be such that one steps in easy strides from one stone to the next (i.e. about two feet from the centre of one to the centre of the next).

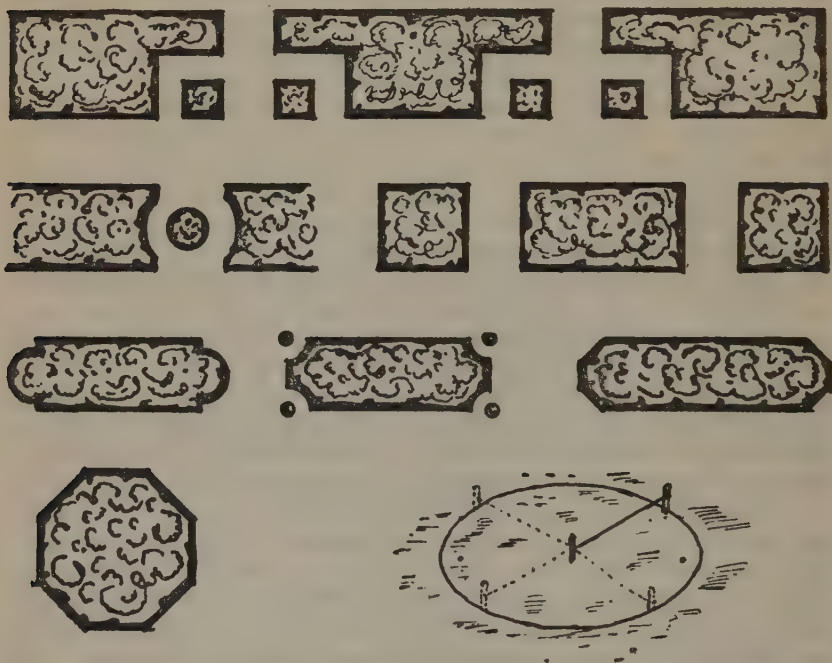
PERGOLAS

The shaded walk in some form or other has doubtless been a feature of southern sunny gardens all through the ages. In British gardens

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it is not exactly a necessity, since there are comparatively few days when sunshine is unbearable in its intensity. At the same time, British gardeners realize the immense aesthetic possibilities of the flower-covered pergola, and are more and more making use of this feature in garden design.

The use of the pergola in the garden is not only to provide a shaded walk, but partly to break the flatness of the design, and in many cases, also, to provide privacy, or to divide two portions of the garden. In



There are many designs for formal beds for bulbs and summer bedding plants. Here are a few suggestions, which would be pleasing on a terrace

small gardens, for instance, the pergola is often introduced to divide the vegetable garden from the flower or pleasure garden.

The material used in the construction depends partly on the use to which the pergola is put, and partly on the material used for other architectural features and for the house itself.

Dignity of Stone.—Where a dignified appearance is desired in a large garden, a pergola made of stone piers, with substantial oak runners is ideal. Short brick pillars, with heavy oak supports built

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into them, and oak rails above, are also in keeping with a substantially built house.

Pergolas of this type should never be less than 8 ft. wide, and the runners should not be closer together than the width of the path. It is not necessary in this case to cover the pergola completely with climbing plants, and *plenty of sunshine should be allowed to penetrate to the path below* for the graceful outlines of the pergola to be shown to advantage.

For the bungalow or cottage, a pergola of peeled or unpeeled pine poles creates a delightful rustic effect. Even here, the width of the pergola should be such as to allow a substantial path below, where walking will be comfortable. A narrow pergola means that the climbers, particularly if they are thorny roses, will obstruct the pathway.

Division Pergolas.—The pergola that also forms a screen between one section of the garden and another, can, if desired, be closed completely by a light trellis on one side. This trellis can be of unostentatious rustic work, or in the case of a more formal type of pergola, a rather open, square trellis should be chosen.

All pergolas should be well furnished with climbing plants, which can be grown in a bed which is continuous all along the side of the pergola, or in small square or circular beds that surround the foot of the posts. Where the pergola is partly pergola and partly screen, the bed should be continuous.

It is not always necessary, or even desirable, for such a division pergola to be of straight design. A semi-circular pergola and screen combined make a delightful finish to a lawn, particularly if backed by groups of tall evergreens. Behind this, the vegetable garden will be completely hidden.

Paths Below Pergolas.—It is important to choose the right type of material for paths over which a pergola is built. During wet weather, rain will drip on to the pathway, and it is therefore desirable that the path should be of brick, stone or tiles, so that it will dry quickly.

A very wide path, entirely of flagstones, may be rather too severe for some types of garden, and where this is undesirable, the path beneath the pergola can be of grass, with a centre walk of flagstones. This makes it possible for the path to be used immediately after showery weather, and at the same time retains the soft effect of the grass.

The pergola should always be beautiful in itself, and it should be remembered that when climbing plants are needed to cover the natural ugliness of a pergola, it can never be a successful feature of the garden. A well-designed pergola is one of the best ways of introducing beauty and form into a new garden and its artistic effect is immediately apparent.

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When making a pergola the posts should be driven well into the ground. For instance, an eight-foot post should have at least two feet below the surface (i.e. ten feet in all) and this two feet should be tarred or treated with some other preservative. To make the posts more secure they are often embedded in cement.

A pergola can be made entirely of wood in this way, or the sides of the pergola can be in the form of a low stone brick wall, or the posts can be brick or stone, with wooden runners (i.e. the pieces that cross the top to make the arches).

If a rustic pergola is built, it should be made of very durable wood, such as Yew, as the climbing plants take some time to establish themselves and reach maturity. If soft wood is used, just as the plants reach their full beauty, the pergola may break down.

STONE WALLS,

In districts where quantities of stone are easily obtained, division fences often take the form of stone walls. The whole wall may be of stone, or there may be a low stone wall above which trellis, or other screens, are erected. Walls of this type should invariably be built with soil in some of the crevices instead of cement, so that the wall itself can become beautiful with age. If they are well constructed, and laid on a foundation of ballast and cement, such walls are quite as satisfactory as walls built of cement, and are always more picturesque.

All high brick walls erected as boundaries can be clothed with climbing plants. They are, of course, ideal for growing fruit trees of the cordon, espalier, or fan-trained type.

A *retaining wall* is not built quite vertically, but slopes back slightly towards the top, and each stone slopes a little downwards into the bank.

The type of stone used for walling is usually either sandstone, which is a hard brown stone, supplied in pieces three to four inches thick, or York stone, which is greyish brown in colour and is used for more formal walls, and generally bound together with cement. A ton of stone builds approximately four square yards of wall.

Yorkshire stone, when cement only is used with it, makes a feature that looks stony-hearted, and the gardener who loves plants and wants to include them wherever possible, will be wise to give preference to the sandstone, built with soil in the cracks.

The method of wall-building is simple. It is desirable to slope the wall as it is built from the base upwards, and a stake driven in vertically at the base will help the builder to keep the slope even. A quantity of soil is prepared by sifting sand, loam, and leaf-mould together, and this is rammed between the stones, leaving no air spaces

GARDEN CONSTRUCTION

behind them. Every few feet, a long stone is allowed to penetrate into the soil behind, to bind the whole firmly.

Each stone must rest firmly on the one below, without wobbling. If cement is used in the place of soil, "tear holes" are left at intervals of about six feet, to allow water to drain away, otherwise the stones may be forced out of position.

It is sometimes best to use cement in some places and soil in others, for greater safety, and good use can often be made of a little cement to construct a kind of rude pocket, which will hold an extra large supply of good soil for a special plant. This is a touch which makes a new wall look quite an old-established feature.

If possible, the plants are set during building, for this is easier, and less likely to end in damage to either the plant or the wall. If they cannot be easily obtained at the time the wall is made, it may be best to use seeds. A ball of soil, with a few seeds intermixed, moistened, and pressed into the cracks of a completed wall, rapidly produces plants that look as if they came there by the hand of Nature.

DRAINAGE

Drainage is an important matter in the garden in every section of it. Neither paths, lawns nor flower beds can be made satisfactorily unless the ground has already been well drained.

Let us consider what to do with the garden where the ground appears to be waterlogged. If, for example, when a hole about fifteen inches each way is dug and left for a day or two, water collects and remains stationary in the bottom of the hole, the ground must be provided with extra drainage. Ordinary deep digging will not be sufficient to carry off the surplus moisture. The time to improve the drainage in this way is, of course, before any other garden construction is begun.

Three-inch pipes inserted one foot below the surface and laid in parallel lines with about fifteen feet between each line, are sometimes sufficient to effect good drainage. Occasionally, it may be necessary to add some smaller drains, two to three inches in diameter, and to carry them into the larger drains at an angle of sixty degrees every fifteen feet. This means that it will be necessary to excavate trenches say about fifteen inches deep and fifteen feet apart, and to join them herring-bone fashion, allowing a slight drop in the bottom of the trench towards one end of the plot. The surplus water will be carried to this end and some special arrangements must be made to carry it away either into the main drains or into an artificial sump. As a matter of fact, it is rarely necessary in the little garden to make any such drains as described, and even in a garden which appears at first sight to be waterlogged, it will probably be found sufficient to excavate one or two trenches

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and to fill the bottom of each with all kinds of rough material, such as tins (beaten flat), broken crocks, bundles of brush wood or gorse, and rough clinker.

USEFUL DATA

Some useful garden data is given below for the guidance of the amateur gardener in getting out estimates.

Areas.—1 rod equals 30 square yards.

10-rod plots (allotments) are frequently plots measuring ten yards by thirty yards.

4,840 sq. yds. equals one acre.

Weights and Cubic Contents.—1 load of soil or gravel equals 1 cubic yard.

1 ton of soil equals 18 cubic feet.

1 ton of gravel equals 20 cubic feet.

The cubic content of a greenhouse (for fumigating purposes) is equal to the length, multiplied by the breadth, multiplied by the height of the sides to the eaves plus half the height from the eaves to the ridge.

Stone and Bricks.—1 load of paving bricks equals 500 bricks. The number of bricks to the square yard of path is 36 (face up), or 52 (side).

1 ton York crazy paving (light brown, beautifully coloured), covers 10 to 11 square yards.

1 ton of Somerset crazy paving (rough faced, brown), covers 8 to 10 square yards.

1 ton of Welsh crazy paving (dark grey), covers 10 square yards.

1 ton walling stone builds about 4 super yards of retaining wall.

Turf.—Ordinary turves are cut 1 ft. by 3 ft.

Cumberland sea-washed turf is cut usually in foot squares.

Area of Beds.—The area of a square bed is the length by breadth.

The area of a circular bed is half the distance across, multiplied

by itself, and multiplied by $\frac{22}{7}$

SIZES OF GAMES COURTS

Badminton Court.—44 ft. by 20 ft., double court.

44 ft. by 17 ft., single court.

Croquet Court.—105 ft. by 84 ft. (Hoops at 21 ft. intervals.)

Tennis Court.—Full size, 36 ft. by 78 ft.

Single court, 27 ft. by 78 ft.

(For run-back allow 120 ft. by 60 ft.)

CHAPTER III

HARDY PERENNIALS—THEIR USE IN THE HERBACEOUS
BORDER—LISTS OF POPULAR KINDS—HALF-HARDY PEREN-
NIALS FOR BEDDING—COLOUR LISTS.

POPULAR HERBACEOUS PERENNIALS

MODERN Varieties are Best.—The most popular and at the same time the most difficult feature in the garden is the herbaceous border. Perennial plants are like true friends, not here to-day and gone to-morrow, but always with us, and becoming more and more valuable as time passes. It can be taken as a general rule that a single perennial plant set in the border and liberally treated, will make at least half a dozen plants at the end of, say, two seasons. This does not apply to every inhabitant of the perennial border, but the majority can be increased as much as this, and some a good deal more. For this reason it pays the amateur gardener to grow only the best varieties in his border and to be ruthless in scrapping old worthless kinds in preference of new ones.

Certainly the new garden owner should make a rule not to include in any of his schemes anything of inferior quality. Modern hybrids are so vastly superior to the types known to our grandparents, that anyone who has seen the two together would not think twice about which to use in a garden. Take for instance the Delphinium, which is popularly regarded as the King of the Flower Border. Modern types reach a height of ten feet and bear enormous flowers in every shade of blue and mauve. They are hardly recognizable as of the same family as the small insignificant blue-flowered Delphinium that was known to Shakespeare. But even the finest of modern types of border flowers cannot be grown to perfection without care over soil preparation and general cultivation.

Soil Preparation.—The preparation of the herbaceous border will be on lines laid down in Chapter XVI; that is to say, the soil will be deeply dug, leaving the most fertile spit at the surface. The texture of the soil will also be improved. For instance, if it is of stiff clay, sand, road grit, leaves, dry manure and any ashes that are available will be mixed with it during digging. If it is sandy soil, cow and pig manure

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(if obtainable), leaves, decayed grass clippings and other vegetable matter will be worked into it. It is not sufficient just to dig the top spit of soil, as not only do plants root deeply, but they take a considerable quantity of moisture from the soil during the growing season. Only a very deeply-dug soil, well broken below, can hold sufficient moisture to satisfy the plant roots when the weather is dry and warm.

Bone-meal is one of the most popular and best fertilizers for the herbaceous border. It is slow acting, and its effect is, therefore, felt all the time the plants are growing. Perennial plants, as a rule, are left in position without disturbance for somewhere about three years, and during that period very little can be done to improve the fertility of the soil. If the border to be planted with herbaceous perennials is one in which the top soil has become a little exhausted, it is good practice to work up a very little of the under layer into the top soil as the digging is done. Heavy dressings of bone-meal can be used, and lime will of course be dusted over the surface. With such preparation the border will need no other treatment for three seasons, except that, during the winter, the soil between the plants will be forked over, and during the summer the hoe will be kept going constantly in order to keep the top friable.

Painting the Picture.—A bare border is like an empty canvas. We can paint upon it what colours we will, and we can paint them to last three succeeding seasons. There are to-day almost innumerable good herbaceous plants which can be used, and which flower at different times throughout the year. The planting of a perennial border is rather like solving a jig-saw puzzle. You have to fit in the various plants in such a manner that the border will be colourful from early summer to the time the frosts arrive. You have also to arrange the colours so that they do not clash, and you have to arrange the plants so that each is seen to best advantage, which means that you must not hide dwarf plants behind tall ones and also that you must more or less camouflage the unsightly base of the stems of tall plants such as Hollyhocks.

Avoid Formality.—A very common mistake amongst new gardeners is that of planting the mixed border in too formal a fashion. Plants are purchased by the dozen or half dozen and set at regular intervals all along the border. Heights are arranged with uncompromising regularity, dwarf plants in the front, medium plants behind them, tall plants in the back row. A slight variation of these forms makes a much more pleasing picture. For instance, there is no reason why a medium-sized, bushy plant should not here and there approach the front row of the border. It breaks the view of the border seen from one end, and impels the visitor to pass along its whole length in order to appreciate its beauties.

POPULAR HERBACEOUS PERENNIALS

PLANTING HINTS

When the perennial border is to be planted, it is best to set out labels where each group of plants is to be. The groups should vary in size, and should err on the side of large masses rather than small. You get a much finer effect from half a dozen plants of one kind together than from the same number of plants dotted here and there along the border between other kinds.

As a rough guide, I should say put in three plants of such things as Oriental Poppies and Geums in a group, or put six Pansies or Wallflowers in a group. Even Delphiniums can be planted in groups of three in the very wide border, though in the small narrow border single plants of these very large kinds can be used. The labels should be prepared before planting operations are begun, and when the border has been dug, manured and dressed with lime, and is ready for planting, the labels should be set out in exactly the positions where the groups of plants are to go. This avoids the possible necessity for rearranging the plants after half of them have been put in.

Plant Firmly.—An important point is to plant firmly. There are more losses of perennial flowers due to loose planting than to any other factor. Plant roots can only take up food in solution. If they are not well supplied with soil moisture, therefore, the plants will starve. A plant which is set loosely in soil may have its roots in dry air pockets, and suffer in consequence. As each plant is put in, therefore, the soil should be firmly pressed down over the roots. This precaution also prevents the tops of the plants from being swayed in the wind, and so loosening the roots still more in the soil.

Another common fault is to allow the plant roots to be doubled up under the plant. Holes should always be made with a trowel or spade, deep and wide enough to take the roots spread out to their fullest extent, as far as possible horizontally.

Fine soil should be thrown over the roots in the case of large plants and then the remainder of the soil pressed firmly into position. Should frosts occur after planting it is worth while to go round the perennial border and to press back into the soil any plants that have been lifted up by the action of frost.

Autumn the Best Planting Season.—The season for planting varies a little according to the type of plant, but generally speaking the earlier in autumn that a new perennial border can be planted, the more likely it is to succeed. In a very smoky town district, however, autumn planting is not perhaps so good as spring planting. In any case, March is a fairly satisfactory month for planting almost any type of perennial, and so long as the plants do not suffer from drought during the first few weeks March planting will always be successful.

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Avoid Crowding.—Herbaceous plants are plants of which the roots are perennial, that is to say they last for several years, while the flower stems are of annual duration only. A seedling perennial plant frequently sends up only a single flower spike, but during the second season of its growth it may send up half a dozen similar spikes, and so go on increasing from year to year. There comes a time, however, when these spikes get too crowded, as they rise from the single root-stock, to allow of full development, and if many stems are allowed to grow up in this manner they lose their symmetry. That is one reason why it is so important to thin out the growing stems of such plants as Michaelmas Daisies, Delphiniums, Chrysanthemums, etc. If you want to experiment in this direction, try growing a single stem of Michaelmas Daisy from one root instead of allowing other stems to develop, and compare the beauty of growth and the arrangement of the flowers round the stem with that seen on stems growing in a crowded clump.

Exhibition growers invariably reduce the number of stems of a plant to one in order to achieve good results. The owner of an ordinary mixed border may not want to be quite so drastic, but it is a fact that he will get a better show of flowers from two or three stems, than from a dozen on each plant. The time to remove the unwanted stems is of course as soon as they show up, as the longer they remain on the plant the more nourishment they are taking. It will be found that the removal of unwanted stems is, in fact, a practice that makes staking easier and in some cases unnecessary. The remaining, encouraged, stems grow stouter and sturdier, and if the garden is not exposed to high winds, they may require no stakes at all.

HOW TO STAKE

Where stakes are required in the perennial border they should be selected and used with care, otherwise the border becomes merely unsightly. On no account should half a dozen stems from a plant be gathered to a single stake. Efficient plant supports are sold by nursery-men, but if these are not used, ordinary thin stakes *reaching to the base of the flower head* will be found quite satisfactory. One stake should be used to each stem. In the case of a group of half a dozen stems, three stakes placed round the clump, with a string passing from stake to stake, may be sufficient support. The essential thing to remember is that the stakes should be hidden as far as possible amongst foliage, so that they are not seen when the plant is at its best.

Certain plants such as the Carnation, which grows very long slender flower stems rising well above the foliage, need even more careful staking than the ordinary bushy herbaceous plants. A very thin stake should be used in these cases and tied in several places as the flower stem

POPULAR HERBACEOUS PERENNIALS

develops. Bamboo canes are generally chosen, unless special Carnation supports are used.

Staking Large Groups.—Staking in the border devoted solely to Michaelmas Daisies is perhaps a little more complex. In such a case the number of stems to each plant may not be so restricted, and some of the groups may consist of twenty or thirty stems. Half a dozen stakes



STAKING A CLUMP FROM THE BACK

STAKING TALL FLOWER SPIKES

Border plants should be staked as unobtrusively as possible. Either take the string round the support and then round the stem or else give it a twist as shown

round the outside of such a mass are sufficient. A strong string should be passed round the clump twice, tied to each stake as it passes. One or two stems may be left outside the string, to be secured later and so hide the stakes from view. Additional strings can be drawn taut across the clump, between opposite stakes, and these will hold the central flower stems firm enough even if rough weather occurs.

A few plants, for instance some of the Poppies, are better staked by pushing in a number of twiggy branches amongst the growing stems. It will be found that they only need this slight support at the base and

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the twiggy stems are hidden from view by the developing foliage and flowers, and in any case are not very unsightly.

Summer Cultivation.—Apart from regular staking the chief thing to be done in the perennial border during the summer is to keep the ground hoed between the plants. This prevents the soil caking, and also prevents the too rapid evaporation of moisture from the soil. If bone-meal is used when the border is prepared little else will be needed in the way of fertilizer, though a general fertilizer may be of assistance. The general mixture recommended in Chapter XVII is excellent in the flower garden, and can be dusted between the growing plants, just before the hoe is used.

Watch for Pests.—The commonest pests in the perennial border are green-flies and frog-hoppers though other pests do appear from time to time. Watch should be kept for their appearance, and a good reliable insecticide should immediately be used and repeated as required all through the growing season. Such insecticides will of course be used only in the evening, and must be used no stronger than directed by the proprietors, otherwise they may cause damage to foliage of tender plants. (See CHAPTER XVIII.)

Planting for Succession.—In choosing plants for the herbaceous border the succession of flowers must be kept well in mind. Early flowering perennials such as Antirrhinums, Columbines and Wallflowers start the year in the herbaceous border. They are followed in rapid succession by Peonies, Delphiniums, Lupins, Chrysanthemum maximum, Geums, Heleniums, Phlox, Scabious, Montbretias, Rudbeckias, Japanese Anemones, and Michaelmas Daisies. The important thing to the gardener should be the disposal of these and similar herbaceous plants in the border in such a manner that at every season from April to November, the border has colour and interest along its whole length. Experience counts much in this matter, but the novice will find the lists given at the end of this chapter helpful in selecting plants to provide floral succession.

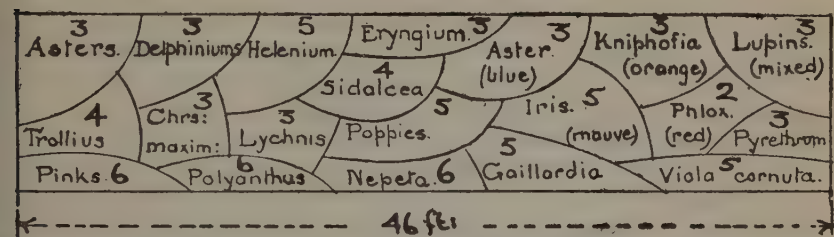
Colour in the Herbaceous Border.—Endless books could be and have been written on the subject of colour in the herbaceous border. Many schemes have been tried out, particularly such schemes as those which exclude one colour range and include only its complementary colours.

For instance, shades of blue, mauve, and white and often shades of pale lemon colour are chosen and clear reds and pinks are rigidly excluded. The effect is that of a "blue" colour scheme as the other shades, among the blues, merely serve to throw up the main colour.

Similarly an orange and red border would definitely exclude the clear blues. While such borders have a certain amount of interest, and often show a good deal of ingenuity, it is doubtful whether they are ever quite so charming and effective as the mixed colour border, or a rainbow border.

POPULAR HERBACEOUS PERENNIALS

Those who do care to try special colour borders, however, might keep these points in mind: a bank of blue flowers (which, incidentally, would not be entirely blue because it would be accompanied by green leaves) looks *less* blue from a distance if it has no lights and shadows. The light and shade in the border is best provided by interplanting purples, mauves, creams and whites among the blue flowers. Blue flowers must of course predominate, and in the same way any other single colour border will be enhanced by the inclusion of flowers in half shades. The lists following this chapter indicate the colours of the flowers as well as their season of flowering, and blue, gold, red, pink or white borders can be worked out by any amateur gardener who wishes to experiment in this direction.



Perennial plants should be in groups of not less than three in the border. This avoids a patchy effect

Most Flowers are Good Mixers.—In the ordinary mixed colour border the greatest care must be taken not to associate too closely flowers of inharmonious tones. There is no need to worry if apparently clashing colours such as pink, magenta, and orange are fairly close to one another, so long as the plants are well supplied with foliage, or if they are interplanted with grey-foliaged shrubs such as Lavender, or with white flowers such as the large Ox-Eye Daisy. As a matter of fact, too much is usually made of the possibility of disharmony in the mixed flower border. *Very few flowers actually clash* when they are seen growing together, and particularly if they form part of a large mixed collection.

Copy the Rainbow.—A rainbow border is quite an interesting feature, and one which many amateurs would like to work out by themselves, even in limited space. To do this, the best thing is to draw a rough plan of the border to scale first, and to divide it into sections to correspond with the various colours of the rainbow, i.e. red, orange, yellow, green, blue, indigo, violet in succession. Then, with a list of plants at his disposal, the gardener groups these into the various sections of the border according to the colour of the flowers.

In the green section such near-white flowers as Solomon's Seal are

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included. This again is a feature which is best as a part of a larger scheme, and I would not recommend the owner of a small garden with perhaps only one or two borders to limit them in this way.

A Swell of Colour.—One other point regarding the use of colour in the mixed border is this: if a border is a long one, to be approached from one end, not seen full face, it is generally better to arrange for the paler tints to be grouped at the two ends of the border and the really vivid, startling flowers to be towards the centre. This is my experience, in practice, and the reason is possibly that a swell of colour, as the border is inspected seems more impressive than if the colour gradually diminishes after the first view.

The Value of Form and Foliage.—I have already suggested that the arrangement of the herbaceous border is like a jig-saw puzzle. It is even more than that. It is like a cross-word with hidden clues. In addition to the points already mentioned, the gardener must consider the general habit of each plant and its foliage effects when the flowers are absent. A bushy plant well supplied with foliage will disguise the long leggy stems of Hollyhocks and Delphiniums for instance. Silver foliaged plants are valuable too, especially some of the dwarf grasses, and such plants as Pinks, Cerastium, and Arabis, which form permanent and not too formal edgings. Then there is the question of form in the foliage. Between broad-leaved plants, a few groups of Irises, Gladiolas and Montbretias with their sword-like leaves make a distinct break in the border, as, also, do some of the taller grasses. And where annuals are grown in association with the perennials, as in most little gardens, a distinct character can be given to the border by the inclusion of such things as the common Maize. With so many things to consider perhaps it is hardly to be wondered at that the mixed perennial border is so difficult to bring to perfection.

From the following brief description of some popular perennials for the mixed border the amateur should be able to make a judicious selection. Recommended named varieties are given in most cases:

ACANTHUS (Bear's Breech).—Chiefly valued for its ornamental foliage, which is said to have inspired the leaf ornamentation in classical architecture. *A. mollis* is a stately plant 3-4 ft. high, with lilac-coloured flowers in August. Sun or shade.

ACHILLEA (Yarrow or Milfoil).—Thrives in dry soils. The best is *A. ptarmica*, "The Pearl"—pure white double flowers, June to October, 2 ft.

ACONITUM (Monkshood).—Thrives in shady borders. The best are *A. napellus*—blue flowers on 4-ft. spikes, May to July, and *A. nepellus album*, a white form of the same.

AETHIONEMA (Burnt Candytuft).—Sandy soil in sunny corner.

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A. grandiflora—rosy pink racemes in June, 1 ft. *A. Warley Rose*—rose pink, May to June, 9 in. Easy to grow.

AGROSTEMMA (Rose Champion).—*A. coronaria*—rich red flowers, June to August, 2 ft. Grey woolly leaves.

ALYSSUM (Madwort).—*A. saxatile*—yellow, May to June, 9 in. (Gold Dust). *A. argenteum*—yellow, silvery foliage.

ALTHAEA (Hollyhock).—Though this is less subject to disease when grown as a biennial, those who can grow it without trouble as a perennial will find it useful in the herbaceous border. White, yellow, red, apricot and other shades, in double flowered forms, are obtainable. They flower in late summer and therefore follow the Delphiniums as useful backgrounds to the border.

ANCHUSA.—*A. italica Dropmore*, gentian blue, June to July, 3-4 ft., free flowering. *Opal*, light blue, May to September, 4 ft. *A. myosotidiflora*, sky blue, March to June, 1 ft.

ANEMONE (Windflower).—*A. japonica* has many rose and white varieties. All thrive in shade and town conditions. All July to October blooming and growing 2 ft. high. *A. pulsatilla*, purple, May to June, 6 in. *A. hepatica*, rose and white varieties, February to March, 6 in.

ANTENNARIA (Cat's Ear).—Flowers everlasting. *A. margaritaceæ rosea*, rosy pink, July to November, 2-3 ft.

ANTHEMIS (Rock Camomile).—*A. tinctoria E. C. Buxton*, yellow flowers excellent for cutting, June to October, 18 in. *A. tinctoria Kewayi*, as above, but deeper yellow

AQUILEGIA (Columbine).—Prefers a moist site with plenty of sun. Long spurred hybrids of *A. cærulea*; give a variety of colours, flowering from April to June, 9-18 in. high.

ARABIS (Wall Cress).—*A. albida*, white flowers in May and June, 9 in. high. The double variety *flore pleno* is the best. Grey leaves. Useful as an edging plant. There is also a form with variegated leaves.

ARMERIA (Thrift or Sea Pink).—Well drained, sandy soil preferred. *A. cephalotes*, large heads of carmine flowers, June, 18 in. *A. maritima*, bright mauve, April to October, 1 ft., thrives by the sea. There is also a white foam, and also *Vindictive*, a bright magenta, both worth growing.

ARTEMESIA.—*A. lactiflora*, pale cream, August to September, 4 ft. A fine subject in the mixed border. *A. stelleriana*, yellow, August to September, 1 ft., silvery foliage.

ASPHODELINE (King's Spear). *A. lutea* is a handsome plant with large spikes of fragrant yellow flowers from June to October, 2 ft. There is also a white variety with double flowers.

ASPHODELUS.—Prefers a sandy loam. *A. ramosus*, white, May to July, 4-5 ft. Useful in the shrubbery or shady border.

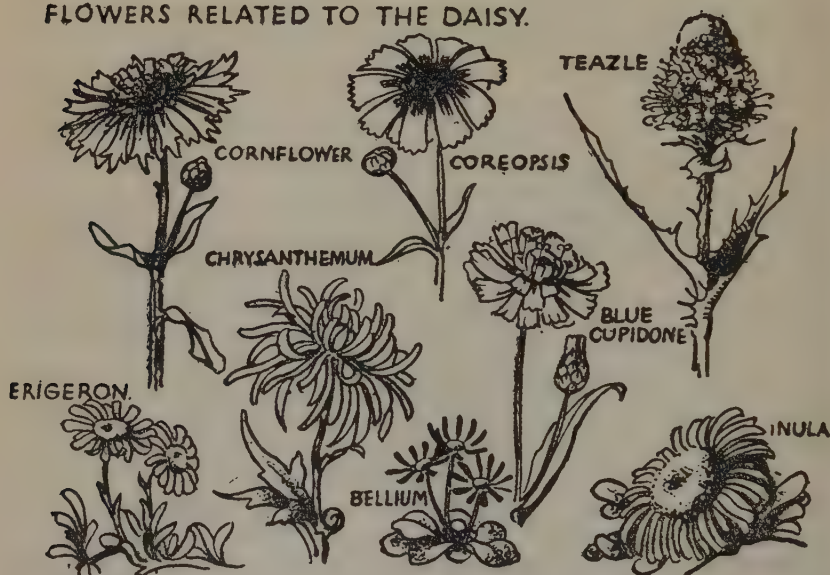
ASTER (Michaelmas Daisy).—A large family of plants of which many

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species, including *A. amellus*, *A. Novæ Belgii* and *A. Novæ Angliæ*, have received a good deal of beauty treatment at the hands of hybridists. Good varieties for the ordinary garden are:

Amellus section: *Empress*, light blue, August to September, 2 ft.; *General Pershing*, pale pink, September; *Queen Mary*, deep blue, August to October, 2 ft.; *Ultramarine*, dark blue, September to October, 2 ft.

FLOWERS RELATED TO THE DAISY.



Many flowers which are quite unrelated are like the daisy in form. They include perennials and annuals

Novæ Belgii section (this section is the best where flowers are wanted for cutting).—*Mammoth* is the showiest of all, with semi-double flowers, 3 in. across, and of a warm lavender shade. Height, 6 ft.; *Blue Eyes*, rich blue, October, 3 ft.; *Empress of Cornwall*, heliotrope, double flowers, September to October, 4 ft. 6 in.; *Little Boy Blue* and *Little Pink Lady*, both 2 ft., the first flowering in September, the second in October; *Mrs. George Munro*, white, September to October, 4 ft.; *Bab Ballard*, lavender blue, October, 9 in.

Novæ Angliæ section: *Barr's Pink*, rosy pink, October, 4 ft.; *Ryecroft purple*, October, 4 ft.

A. Cordifolius: *Silver Spray*, pale lilac coloured flowers, early October, 5 ft.

POPULAR HERBACEOUS PERENNIALS

A. *Ericoides*: *Grey Dawn*, light blue, masses of medium-sized flowers, September to October, 4 ft.

ASTILBE (Goatsbeard).—Suitable for waterside, and always best in a moist situation. All flower from July to October and are 3-4 ft. in height. *Gloria*, deep lilac pink; *Granat*, rich crimson; *Betsy Cuperus*, rosy white.

ASTRANTIA MAJOR.—Best in moist, shady position. Soft pink flowers in June and July, 1 ft.

BAPTISIA AUSTRALIS.—Blue flowers in June. Prefers a sunny spot. 2-4 ft.

BELLIS PERENNIS.—The popular Double Daisy used for edgings. March to June, 6 in. There are several garden forms, in white and rose.

BETONICA ROSEA.—Pretty rose-coloured flowers in July and August. 1 ft.

BOCCONIA CORDATA (Plume Poppy).—Stately plant with ornamental foliage. The flowers are buff coloured, May to August. From 3-8 ft.

BOLTONIA (False Starwort).—*B. asteroides*, pale pink flowers like Michaelmas Daisies in July and September. 4 ft.

BORAGO LAXIFLORA (Borage).—Blue flowers from June to August. 1 ft.

CAMPANULAS.—A large group of plants of varying heights, mostly white, blue or mauve in colour. *C. carpatica*, blue and white varieties, up to 1 ft. high, flowering from June to August; *White Star* is one of the best. *C. glomerata*, purplish-blue, May to September, 1 ft. *C. latifolia macrantha*, purplish-blue, July, 2-4 ft. *C. persicifolia*, white and blue varieties, June to September, 2-3 ft. This is the commonest border species. *C. persicifolia* (Telham Beauty) is well known, Lavender blue, May to October, 2-3 ft. *C. pusilla*, white and blue, June to August, 3 in. Useful as edging plants. *C. pyramidalis* (Chimney Bellflower), blue and white, July to October, 3-5 ft. Only suitable for mild situations or for culture under glass.

CARNATION. See CHAPTER VI.

CATANANCHE *bicolor*, white and blue petals forming an open rosette on a stiff stem. June to August, 2-3 ft. *C. caerulea*, a blue variety. Useful for cutting.

CENTAUREA (Perennial Cornflower).—*C. dealbata*, rosy-pink, July, 2-3 ft. *C. macrocephala*, yellow thistle-like flowers, June to August, 4 ft. All are useful for cutting.

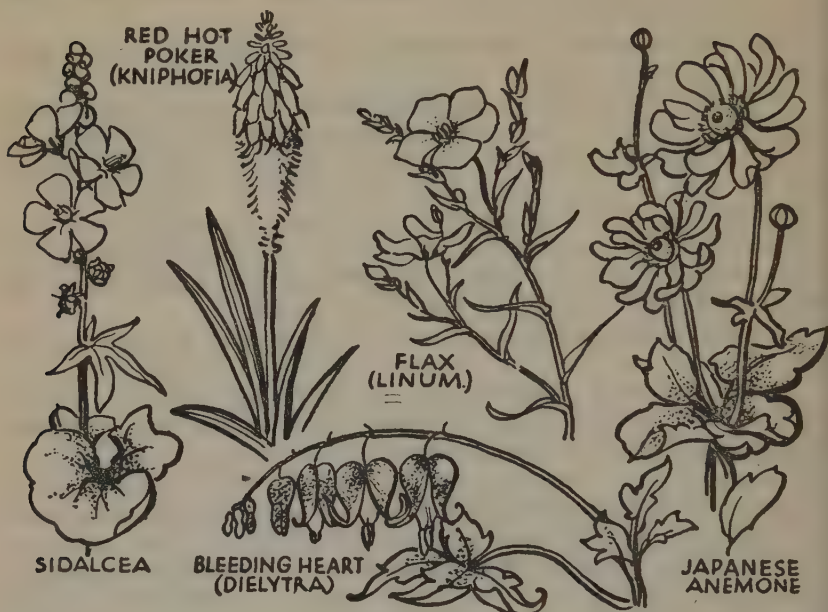
CENTRANTHUS (Valerian).—Old-fashioned plants, for dry soils, flowering from June to August, 2-3 ft. *C. rubra albus*, white. *C. rubra coccineus*, coral-red.

CHRYSANTHEMUM. (For Japanese and Border Chrysanthemums see CHAPTER VI.)

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CHRYSANTHEMUM MAXIMUM.—White-flowered border plants, sometimes called *Giant-Ox-Eye Daisies*, 2-3 ft., blooming in July and August. Some of the newer varieties have fringed petals. A few of the best are *Mayfield Giant*, *Kenneth*, *Marian Collier*, *Phyllis Smith*.

CHRYSANTHEMUM ULIGINOSUM.—Late-flowering Daisy with green centre, 5-6 ft. September to October.



There are many lesser-known perennials which are well-worth growing. A study of an illustrated catalogue helps to keep the gardener up to date

CIMICIFUGA.—Feathery spikes of cream-coloured flowers rising from bold foliage, 3 ft. August to September. *C. simplex* and *C. aponica* are both good species.

CLEMATIS.—There are a few species of Clematis suitable for the border which flower from July to October. *C. Davidiana* has bright blue fragrant flowers, 3 ft. *C. integrifolia*, blue, trailing habit, 18 in. *C. recta*, white-scented flowers, 2-3 ft.

COREOPSIS (Tickweed).—Bright border flowers useful for cutting. *C. grandiflora*, bright yellow, June to September, 2-3 ft. *C. auriculata*, yellow with crimson centre. *C. grandiflora*, Perry's variety, bright yellow, double.

CORYDALIS (Fumitory).—For shady sites. Fern-like foliage.

POPULAR HERBACEOUS PERENNIALS

C. nobilis, fragrant yellow flowers, June to September, 1 ft. *C. lutea*, April to September, yellow, 1 ft.

DELPHINIUMS. See CHAPTER VI.

DIANTHUS (Pinks). See CHAPTER VI.

DICENTRA (Bleeding Heart, or Lyre Flower).—Sometimes known as Dielytra. *D. spectabilis*, is most common. A fine border plant and also good for forcing, March to August, 2-3 ft. Pink and white.

DICTAMNUS (Burning Bush).—Rock or border plants. Dry, warm position, 2-3 ft., May to July. *D. albus*, white. *D. fraxinella*, rose-purple. Emit a luminous vapour.

DORONICUM (Leopard's Bane).—*D. Plantagineum excelsum*, yellow flowers, March to August. Very useful for cutting, 2-4 ft.

DRACOCEPHALUM (Dragon's Head).—Pretty border plants. Cool situation and rich, light soil. *D. virginianum*, pale rose, 2½-3½ ft., June to September. *D. v. album*, white, 1½-3 ft., July to October.

ECHINOPS (Globe Thistle).—Blue thistle-like flowers from June to September, 2-3 ft. *E. Ritro*, and its taller variety *Taplow Blue* are recommended. Both good for cutting.

ERIGERON (Flea Bane).—Aster-like flowers, useful for cutting. Of modern varieties, *B. Ladhams* (pink); *Merstham Glory* (violet-blue); and *Quakeress* (rosy-lavender) are good summer flowering, 1-2 ft.

ERODIUM (Heron's Bill).—*E. Manescavii*, showy, crimson-purple geranium-like flowers, May to September, 18 in.

ERYNGIUM (Sea Holly).—Steel blue flowers, from June to September, 2-3 ft. *E. Oliverianum* (steel blue), and *alpinum* (purplish-blue) are good.

EUPHORBIA (Spurge).—*E. polychroma*, sulphur-yellow corymbs from May to July, 1-1½ in. high.

FUNKIA (Plantain Lily).—White or bluish lilac flowers, very handsome foliage. They grow from 1-1½ ft. high, flowering from May to August. *F. ovata*, *Sieboldii* and *lancifolia* are good varieties. There are also variegated forms.

GAILLARDIA (Blanket flower).—Very showy June to September flower plants, 2-2½ ft. Some of the best modern varieties are *Lady Rolleston*, soft yellow; *Tangerine*, coppery orange; *The King*, red and yellow.

GALEGA (Goats Rue).—White and lilac pea-shaped flowers on 3-ft.-high plants, with feathery leaves, June to September flowering. *G. compacta* and *G. Hartlandii* are good varieties. *G. carnea fl. pl.*, is a good pink variety.

GERANIUM (Cranesbill).—These perennials are the true geraniums. Bedding plants usually called such are really pelargoniums. All the following are about 18 in. high, and flower from June to September:

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G. Endressi, rose-pink; *G. ibericum*, bright blue; *G. platyanthum*, rosy purple.

GEUM (Avens).—Bright border plants, flowering all the summer, growing about 18 in. high. *G. coccineum* variety *Mrs. Bradshaw* is the best known, and has bright scarlet flowers. *Lady Stratheden* is equally good and has golden flowers. Other good varieties are *Fire Opal*, bronze-scarlet; *Orangeman*, orange yellow; *Heldreichii splendens*, orange yellow.

GLAUCIUM (Horned Poppy).—*G. flavum tricolor* has bright orange red flowers from July to September, 2 ft. A curious long horn-like seed pod gives the plant its common name.

GYPSOPHILA (Chalk Plant).—Useful for cutting. *G. paniculata* variety. *Bristol Fairy* is the best double-white varieties, 2-4 ft., June to August.

HELENIUM (Sneezewort).—Summer and autumn-flowering perennials, very showy, increased freely by root division each year. *July Sun*, golden-yellow, July, 3 ft. *H. autumnale*, bright yellow, September to October, 5 ft. *Riverton Beauty*, lemon-yellow, August to October, 3-4 ft. *Riverton Gem*, coppery red, August to October, 3-4 ft. *Crimson Beauty*, July to October, 2 ft., fine for cutting.

HELIANTHUS (Sunflower).—Best are *H. multiflorus plenus* varieties *Soleil d'or*, 4 ft.; *H. rigidus* variety; *Miss Mellish* and *Monarch*, 5-7 ft. All have yellow flowers from August to October.

HELIOPSIS.—Orange yellow, July to October, somewhat like sunflowers, but less spreading, 5 ft. high. *H. scabra* most commonly grown. *B. Ladhams* is a variety with semi-double yellow flowers.

HELLEBORUS (Christmas Roses).—December and January, blooming, 9-12 in. high. *H. niger*—white and its white variety *grandiflorus* are very decorative. These plants set in groups, make a most attractive feature in a mixed border. They may need slight protection if the blooms are to open well as desired in January, but they well repay this trouble. It is sufficient to use odd pieces of glass, raised a little from the ground to make a "roof" over each plant, so that the blooms are kept clean and unspoilt by winter rains.

HEMEROCALLIS (Day Lily).—*H. flava*—yellow fragrant. *H. aurantiaco major*—deep orange. *H. fulva*—orange crimson. All grow from 2-3 ft. and flower from June to September. Each flower lasts one day, hence the common name, but as there are 6 to 9 on a stem, the effect of groups in a mixed border is very good. There are modern name hybrids such as "Apricots," "Gold Dust" and "Sir Michael Foster," which are specially good.

HESPERIS (Sweet Rocket).—*H. matronalis* has fragrant pinky-white flowers from June to September, 2-3 ft. *H. alba plena* is a good double white variety.

POPULAR HERBACEOUS PERENNIALS

HEUCHERA.—Dainty sprays of pink or red flowers, somewhat resembling those of London Pride, 2 ft., May to August. *H. brizoides* "Crimson Spray" is a worth-while variety.

HIERACIUM (Orange Hawkweed).—*H. aurantiacum* is the best known variety, and blooms in June. About 1 ft. high, with orange flowers. The variety *H. villosum* has silvery glaucous leaves. Suitable for a position near the edge of the border.

IBERIS (Perennial Candytuft).—Evergreen edging plants a few inches high, with white flowers right through the summer. The best is *I. sempervirens* and its varieties, "Snowflake" and "Little Gem."

INCARVILLIEA.—The best known varieties are *I. grandiflora*, with purply crimson flowers, flowering from June to August, 1 ft., and *I. Delavayi*, 1½ ft., flowering from June to July, flowers shading from deep purple to bright lilac, with handsome foliage. "Bees Pink" is a variety of *Delavayi* with pink flowers.

INULA (Fleabane).—A hardy plant, which grows where many plants fail. The best known variety is *I. glandulosa*, which has old gold flowers, 2 ft., July to August. Its variety "grandiflora" is deeper orange, and rather finer in appearance.

IRIS. See CHAPTER VI.

KNIPHOFIA (Red-hot Poker).—A brilliant and hardy plant with long stiff flower stems, and graceful curving leaves. It has a wide variety of colours, ranging through red and orange, yellows, and nearly white. The best known types are *K. aloides* of red and orange colouring, 3 ft., autumn, *K. a. grandiflora*, coral to orange colour, 4 ft., July to September, and *K. caulescens*, reddish salmon to white, tinged yellow, with thick stems, 4-5 ft., June.

LAVATERA *alba* (Mallow).—A shrubby mallow with mauve-pink flowers, 4-5 ft., June to October.

LIATRIS (Blazing Star or Kansas Gay Feather).—Favourites for dry soil, with an unusual habit of growth. They flower first at the top of the dense spike, and continue downwards. The best known variety is *L. spicata* which has purple-pink flowers, 1-2 ft., August to September.

LILIUM CANDIDUM (Madonna Lily).—These are bulbs that will grow almost anywhere, but like lime in the soil. They have pure white flowers, grow from 3-4 ft. in height, and flower from July to August. They are usually grown in mixed herbaceous borders, where they associate well with delphiniums. They should be grown without disturbance for a number of years, and only lifted and divided when overcrowding occurs. Such lifting should be done in August, when the flowers fade. Insects, and a disease which sometimes attacks the bulbs, may be treated

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by watering with permanganate of potash crystals in water, diluted to a pale rose colour.

LINARIA (Toadflax).—*L. repens* "Snowflake," has snow-white sheets of bloom, 2-3 ft. high, and flowers from July to August. This is a useful flower for cutting.

LINUM (Flax).—Best known varieties are *L. flavum*, which has yellow flowers, 1-2 ft., May to June, *L. perenne*, with pearly-blue flowers,



By removing faded blooms from perennials, the flowering season can be prolonged through many weeks

2-3 ft. high, May to August, and *L. album* with snow-white flowers, May to August.

LOBELIA.—This hardy plant ranges in size from dwarf African Lobelias to large border plants. The best border type is *L. cardinalis* (The Cardinal Flower) which has vivid scarlet flowers, 3 ft., May to September. The roots should be covered with a few handfuls of ashes in winter, as the plants are inclined to be tender.

LUPINUS (Lupins).—Plants of the easiest possible culture, that will grow and flower well anywhere except on pure chalk. They do not mind a percentage of lime in the soil, but are averse to large quantities. Sunshine, and deeply-dug soil are best, but some success can be obtained even in half-shade. The ordinary border Lupins are hybrids and varieties of *Lupinus polyphyllus*, and grow usually 3-4 ft. high. A single plant, when well established, will send up half a dozen stout

POPULAR HERBACEOUS PERENNIALS

stems. Some of the colours which are possible will be seen from the following list of worth-while varieties:

Herbaceous Lupins

Black Knight,	violet purple;
Chocolate Soldier,	chocolate and yellow;
Geraldine Kelway,	rosy-pink;
King of Blues,	blue;
Sulphur Gem,	sulphur yellow;
Nelly,	white, to rose;
Saxe Blues,	steel blue.

Hybrids of semi-shrubby habit

Blue Star,	blue-white;
Lord Lambourne,	yellow and chocolate;
Sunshine,	yellow;
Fairy Queen,	white to lavender.

LYCHNIS (Campion).—The best known varieties are *L. chalcedonica*, which has brilliant scarlet flowers, 1½–4 ft., May to August; *L. c. plena*, the same but not quite as tall and with double flowers; *L. dioica rub. plena*, which has very bright pink flowers, 2 ft. high, May to August, fragrant, and *L. Haageana*, scarlet flowers, 1½–2 ft., May to August.

LYTHRUM (Purple Loosestrife).—The best known type is *L. virgatum*, which has bright reddish purple flowers, is a compact grower with neat foliage, grows from 2–3 ft. high, and blooms from June to August.

MONARDA (Bergamot).—These are great bee plants and very ornamental. *M. didyma* has bright scarlet flowers, grows from 2–4 ft. high, and blooms from July to September. The variety "Cambridge Scarlet" is specially fine.

MORINA (Whorl Flower).—*M. longifolia* has pink, white and crimson flowers on a spiky column, with handsome foliage, 2–3 ft. from June to September.

NEPETA (Catmint).—All the varieties of this hardy plant grow to 2 ft. in height. The best known is *N. Mussini*, pale lavender-blue flowers, 12–18 in., May to August. This makes a lovely path edging, and interplanted with group of Gladiolas in orange or pink shades is specially striking

OENOTHERA (Evening Primrose).—Despite its name, the flowers of this hardy plant are mostly open in the day as well as the evening. The best border species are *O. macrocarpa*, yellow, 6 ins., June to September. *O. speciosa*, white flowers, turning pale pink, 1½–3 ft. high, March to September. (The family also includes Godetias, which are treated under Annuals, Chapter V.)

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ONONIS (Rest Harrow).—*O. hircuna*, pretty, bright rose flowers, 2 ft., from June to August. Very good for a dry bank.

ONOSMA (Golden Drop).—*O. taurica* has extremely beautiful flowers, which grow in yellow clusters, $\frac{1}{2}$ –1 ft., from May to September. Likes a sunny well-drained situation. (An excellent pot plant.)

PEONIA (Peony).—The herbaceous Peony is *P. officinæ*. Both this and the shrubby species *P. moutan* have given rise to the hybrids that we now grow in borders. All like deep rich soil, the ideal being two parts loam to one part cow manure, but no fresh manure should come in contact with the roots when planting. Five ounces of bone-meal and two ounces of sulphate of potash, with plenty of leaf-mould, or humus in some form, make an excellent annual dressing, allowing this quantity of artificial fertilizer to the square yard. Planting is best completed during September, and the plants should not be disturbed except when absolutely necessary, as the newer varieties are shy of flowering for a year or two after planting. When it is desired to increase the stock, cuttings of pieces of root, 6–8 in. long, with “eyes” to each, are planted with the tops not more than 2 in. below the soil surface, and 2–4 ft. apart to allow for future development. It is sometimes best to take these from the parent plant without actually lifting the main plant, so that there is less disturbance. Diseases are infrequent, but can be treated with Bordeaux Mixture if they occur.

Good varieties are:

Full-skirted, like the old-fashioned peony.—“Lady Alexandra Duff,” blush-pink; “Lady Beresford,” lilac; “Lady Carrington,” white; “Kelway’s Remembrance,” crimson, purple and white; “Una Howard,” reddish carmine.

Single Peonies.—“Baby Kelway,” flesh; “King Albert,” rosy violet; “Nellie,” blush-pink; “Pink Pearl,” lavender-pink; “Pride of Somerset,” deep crimson; “Marguerite Dessert,” almost white.

Imperial Peonies.—(Bright bowls of colour, filled with silky tangled threads.) “Globe of Light,” rose with gold centre; “Moonlight,” silver white with cream centre; “Queen Alexandra,” white with golden heart; “Lord Cavan,” cherry rose with rose and gold heart.

PANSIES. See CHAPTER VI.

PAPAVER (Iceland Poppy).—*P. nudicaule*. Yellow, orange or white flowers on long graceful stems, $\frac{3}{4}$ –1½ ft., from May to August. Only lives successfully through the winter in warm light soil, and is therefore usually treated as a biennial and sheltered in a frame in winter. *P. orientale* (Oriental Poppies).—Many beautiful hybrid varieties now obtainable, some of the best of which are as follows:

“King George,” scarlet, with black blotch, 2½ ft., May to June; “Lady Roscoe,” salmon-orange, 3½ ft., May to Aug.; “Mahony,” carmine-

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purple, almost black, 3 ft., May to July; "Mrs. Perry," salmon pink, 3½ ft., Aug.; "Mrs. Stobart," carmine-rose, 2½ ft., June to Oct.; "Perry's White," white with purple blotch, 3 ft., Aug. to Oct.

PHLOX.—The border Phloxes so showy in early autumn are varieties of *Phlox decussata*. Modern strains are rather dwarfer, and because of their clear colours, showier than older types. They need good rich deep loam, a top dressing of leaf-mould or good soil each spring, and occasional drenches with water in dry weather. In soil inclined to dry out, a useful practice is to lift the plants annually and replant them 2 in. deeper than before in the soil of the border. They generally seem inclined to grow out, and dry out, otherwise. Good varieties for the garden are: "Border Gem," dark violet or wine colour; "Eug. Danzanvilliers," rosy lilac with white centres; "Europa," snow-white with carmine-rose centre; "Firebrand," orange-scarlet; "Gen. Van Heutz," orange-scarlet with dark centre; "Le Mahdi," violet-blue; "Freifraulein von Lassburg," white.

PHYSALIS (Winter Cherry, or Chinese Lanterns, or Bladder Cherry).—*P. Alkekengi* has white flowers, grows from 1-1½ ft. high, and flowers from June to July. The scarlet fruits of these pretty plants, so valued as winter decorations, are their chief characteristic. It is best to hang them in bunches head downward after gathering them, until the leaves shrivel.

POTENTILLA (Cinquefoil).—These plants bloom from June to August. The colours of the flowers range from deep crimson, orange, yellow to white and pink. *P. chrysantha*, yellow, 2 ft., is useful in the border.

PRIMULA. See CHAPTER VI.

PYRETHRUM.—These are now included in the same family as the *Chrysanthemums*. They can be had in either single or double varieties; colours ranging from pure white, through all the shades of pink and red, to deep crimson and purple. They grow to about 2 ft. in height, and are invaluable for Whitsun decorations. If cut down after flowering in May and June, they flower again in August.

Good rich loam suits them best, and well-rotted manure worked into the soil before planting increases the size and quality of the flowers. From February to April, and July and early August, are the best planting seasons. A mulch of old manure round the plants is beneficial if the soil is inclined to be dry. Coarse sand strewn over the crowns of the plants keeps away slugs in spring, before new growth begins.

Recommended varieties are:

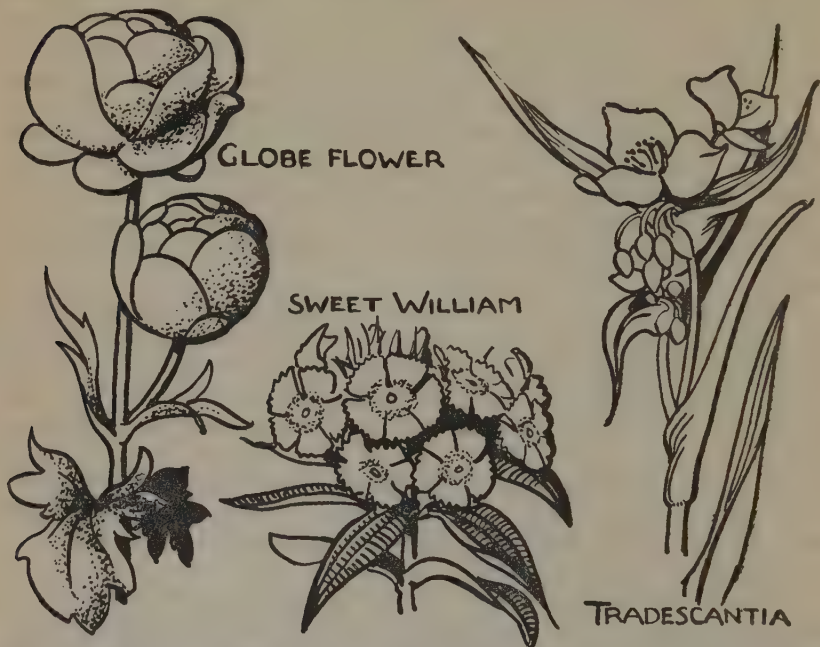
Singles.—"Avalanche," flesh white; "Harold Robinson," scarlet; "James Kelway," scarlet-crimson; "Phyllis Kelway," soft pink; "Snow White," white (including a white centre); "Primrose Dame," primrose; "Lord Milner," Mauve.

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Doubles.—"Carl Vogt," white, very early; "Queen Mary," pink; "Pericles," yellow and fawn.

Anemone-flowered (i.e. with long guard petals and florets in the centre), "Ariel," lemon-pink; "Beauty of Stapleford," rose-cream.

ROSA (Roses). See CHAPTER VIII.



Golden Trollius, red Sweet Williams and purple Tradescantia are three worth-while plants for the mixed flower border

RUDBECKIA (Cone Flower or Thimble Flower).—Very handsome plants. Good species, *R. laciniata*, with yellow flowers, growing to 5 ft. high and blooming from July to September, and its double-flowered variety "Golden Glow." *R. maxima*, yellow flowers, marked with a darker colour, 4-8 ft., August to September. *R. nitida*, "Autumn Glory," rich yellow flowers, 5 ft., Sept. to Nov., and *R. Neumannii* (speciosa) orange yellow with black disc, 2-3 ft., June to Oct.

SALVIA (Sage).—*S. virgata nemorosa* with deep purple flowers, 2½ ft., blooming from June to August, is the best species for the perennial border.

SCABIOSA (Scabious).—Best for the border are *S. caucasica* which has blue flowers, grows 1½ ft. high, and blooms from May to September, and its varieties and hybrids *alba* with white flowers, violet-blue. "Clive

POPULAR HERBACEOUS PERENNIALS

Greaves," a lovely mauve; "Goldingensis," light blue; "Blue Bonnet," $2\frac{1}{2}$ –4 ft., from May to August. Scabious resents any shock due to dry periods and during July it pays to soak the soil occasionally with rain-water, followed by weak liquid manure.

SENECIO (Groundsel).—*S. Clivorum*, has yellow flowers with handsome foliage, 3–4 ft., July to September.

SIDALCEA (Greek Mallow).—A hardy perennial of great beauty. The best for the border are *S. candida*, white, 2–3 ft., May to June, and its varieties "Rosy Gem," with large deep rose flowers; "Sussex Beauty," silvery pink; "Scarlet Beauty," rosy carmine; and "Rev. Page Roberts," pale pink.

SILENE (Catchfly).—*S. maritima rosea*, rose flowers, 6 ins., blooms from June to October, and is excellent at the edge of the border.

SOLIDAGO (Golden Rod).—This is a brilliant and showy plant. Perhaps one of the best varieties is *S. altissima*, which grows to 8 ft., and blooms from August to October with bright yellow flowers.

SPIRAEA (Goatsbeard).—Thrives in marshy districts. The best known is *S. aruncus* which has white flowers, blooms from June to July, 3–5 ft. *S. palmata* (The Crimson Meadow Sweet) with red flowers, 2 ft., July to August, and *S. venusta*, rose-pink, 4 ft., July to August, are more colourful.

STACHYS (Bishop's Wort).—The best known species is *S. lanata* (Woundwort) with mauve flowers, silvery foliage, 1 ft. July to September.

THALICTRUM (Meadow Rue).—Best known are *T. adiantifolium*, the Mock Maidenhair, useful as foliage to associate with cut flowers, and *T. dipterocarpum*, small mauve flowers with yellow stamens, freely produced. The double-flowered variety (Hewitt's Double) is one of the finest hardy flowers recently introduced, 5–8 ft. August.

TRADESCANTIA (Spiderwort).—The best known species is *T. virginica*. Its varieties *alba*, white, and *violacea*, violet, bloom from May to August, $1\frac{1}{2}$ ft. *T. cærulea* with light sky-blue flowers, is the same height and blooms at the same season.

TROLLIUS (Globe Flower).—Thrives under moist conditions. The best known are *T. europæus* which has lemon-yellow flowers, grows from 1 – $1\frac{1}{2}$ ft. high, and blooms from April to June, and *T. hybridus* "Orange Globe" which has rich glowing orange flowers, $2\frac{1}{2}$ ft. April to June.

VERBASCUM.—The best known species is *V. densiflorum*. Yellow flowers, with purple brown centres, 3 ft. June to August.

VERONICA (Speedwell).—The best are *V. amethystina*, bright blue, 1–2 ft. June to July, and *V. longifolia subsessilis* with deep purplish-blue flowers, 1–2 ft. high, July to September, and *V. spicata rosea*, pink, $1\frac{1}{2}$ –2 ft., June to August.

VIOLA. See CHAPTER VI.

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COMMON AND GENERIC NAMES OF HERBACEOUS BORDER PLANTS

<i>Common Name</i>	<i>Generic Name</i>
Asphodel	Asphodelus
Avens	Geum
Bear's Breech	Acanthus
Bellflower	Campanula
Bergamot	Monarda
Bishop's Wort	Stachys
Blanket Flower	Gaillardia
Blazing Star	Liatris
Borage	Borago
Burning Bush	Dictamnus
Burnt Candytuft	Aethionema
Campion	Lychnis
Candytuft	Iberis
Catchfly	Silene
Catmint	Nepeta
Cat's Ear	Antennaria
Chalk Plant	Gypsophila
Christmas Rose	Helleborus
Cinquefoil	Potentilla
Columbine	Aquilegia
Coneflower	Rudbeckia
Cornflower, Hardhead	Centaurea
Cranesbill	Geranium
Daisy	Bellis perennis
Day Lily	Hemerocallis
Dragon's Head	Dracocephalum
Evening Primrose	Oenothera
False Starwort	Boltonia
Flax	Linum
Fleabane	Inula
Fleabane	Erigeron
Fumitory	Corydalis
Globe Flower	Trollius
Globe Thistle	Echinops
Goatsbeard	Spiræa
Goatsbeard	Astilbe
Goat's Rue	Galega
Golden Drop	Onosma

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<i>Common Name</i>	<i>Generic Name</i>
Golden Rod	Solidago
Greek Mallow	Sidalcea
Groundsel	Senecio
Heron's Bill	Erodium
Horned Poppy	Glaucium
Hollyhock	Althæa
King's Spear	Ashpodeline
Loosestrife	Lythrum
Lupins	Lupinus
Lyre Flower	Dicentra, Dielytra
Leopard's Bane	Doronicum
Madonna Lily	Lilium candidum
Madwort	Alyssum
Mallow	Lavatera
Meadow Rue, Mock Maidenhair	Thalictrum
Michaelmas Daisy	Aster
Monkshood	Aconitum
Orange Hawkweed	Hieracium
Ox-Eye Daisy, Shasta Daisy	Chrysanthemum
Pæony	Pæonia
Phlox	Phlox
Plantain Lily	Funkia
Plume Poppy	Bocconia
Poppy, Iceland Poppy, Oriental Poppy	Papaver
Red Hot Poker	Kniphofia
Rest Harrow	Ononis
Rock Camomile	Anthemis
Rose Campion	Agrostemma
Sage	Salvia
Sea Holly	Eryngium
Scabious	Scabiosa
Sneezewort	Helenium
Speedwell	Veronica
Spiderwort	Tradescantia
Spurge	Euphorbia
Southernwood	Artemisia
Sunflower	Helianthus
Sweet Rocket, Dames Violet	Hesperis
Tickweed	Coreopsis
Toadflax	Linaria
Valerian	Centhanthus

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<i>Common Name</i>	<i>Generic Name</i>
Thrift, Sea Pink	Armeria
Wall Cress	Arabis
Whorlflower	Morina
Windflower	Anemone
Winter Cherry, Chinese Lanterns,	Physalis
Bladder Cherry	
Yarrow, Milfoil	Achillea

HALF-HARDY HERBACEOUS PERENNIALS

So far we have treated only of the hardy perennials which can be grown in the open border all through the year. Our gardens would be much poorer, however, if we could not rely on a considerable number of showy flowered plants of somewhat tender nature. It is difficult to imagine our parks and open spaces bereft of all the *Geraniums*, *Begonias*, *Calceolarias* and similar perennial bedding plants. Practically all of these are of course grown in pots in the greenhouse, for indoor decorations, but they are for the most part brought into the open garden to colour the beds and border during the safe summer months, that is, from June to September.

Possibly every one of these subjects requires slightly different treatment; but, in general terms, we can outline their cultivation, and the amateur who owns a greenhouse will soon discover for himself those tricks of the trade which make all the difference between a mediocre garden and one of first quality. Roughly speaking, we can divide these tender perennials into two groups: those with bulbous or tuberous roots, and those with fibrous root-stocks.

Tubers. Such plants as the tuberous-rooted *Begonias* and *Cannas* are treated in very much the same way as are *Dahlias* (*see* CHAPTER VII); that is to say the fleshy roots are started into growth in heat and moist soil, in February or March. By the end of May, or the first week in June, the plants, which have by this time been potted up singly, are ready for setting out in beds, in serried ranks in the formal garden, or in groups in the mixed border.

In the autumn when the leaves have died down, the roots are lifted, cleaned and stored in dry soil or sand in a shed, or under the shelves of the cold greenhouse, until the following spring. Increase of such plants is by division of the root-stocks, removal of young shoots to root as cuttings soon after the new growth commences, or in the more natural way by seed. Seeds of bulbous-rooted plants are, generally speaking, rather long in reaching maturity, and the root division, or propagation by cuttings, is the common practice.

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Fibrous-rooted Perennials.—Fibrous-rooted perennials of tender character and such shrubs as the *Calceolaria*, the *Zonal Pelargonium*, which most amateurs call *Geranium* (both these are shrubby in character if they are allowed to continue growth normally), are also grown outdoors in the summer months and under glass in winter. In this case, however, the roots are not usually dried entirely during the winter months, but remain in the pots. Water is given very sparingly, so that the plants remain dormant, and in early spring an increase of warmth and moisture encourages them to put out fresh shoots.

Uniformity in Size.—Chiefly because the gardener desires, for formal bedding schemes, plants of similar height that will come into flower at the same time, the practice has arisen of taking cuttings each season, and using only these new plants for June bedding. A plant which is set out in June, and flowers during the summer months, will be found by, say, the end of August or beginning of September to have produced, in addition to flower-heads, a number of new side shoots which are at that time in a half-matured condition. These side shoots are ideal for cuttings. They can be taken off and inserted immediately, in sandy soil, in a propagating frame. The majority of such plants can be increased in this manner even without the assistance of a propagating frame, since most cuttings if inserted in sandy soil in a shady part of the open garden, will root in late summer.

Cuttings rooted in August will be ready to pot up for the winter before the severe frosts arrive, and the young plants can be wintered in any greenhouse where it is possible to exclude actual frost.

Certain shrubs such as the autumn flowering *Hydrangea* are frequently used for bedding schemes. It is not always necessary or desirable to take cuttings annually. Sometimes quite large pot plants are merely sunk below the soil level during the summer bedding season in order to produce fine effects, the pot being brought indoors again at the approach of frost.

The following is a brief selection of some of the commonest and most useful of tender herbaceous perennials which are grown in the open garden during the summer:

AGATHEA (The Blue Marguerite). These like sandy loam and leaf soil and have blue daisy-like heads about 1-in. across, in summer. There is one form with variegated leaves which is used for carpet bedding. Increase by cuttings of non-flowering shoots at any time.

AGAVE (American Aloe). *A. americana* grows to an enormous size if allowed to, and if the district is mild. In most districts it is brought indoors during the winter. Plants can be easily raised for decorative bedding by suckers from old plants.

ALTERNANTHERA. Plants with mottled coloured leaves, favourites

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for carpet bedding. Can be increased by cuttings inserted in sandy soil in February and March.

BEGONIA. Begonias belong to both the tuberous and fibrous rooted groups. The tuberous rooted begonias are used for summer bedding, and for greenhouse decoration. They can be raised from seed sown in January or February in well-drained seed pans. These are filled with soil, coarse below, but very fine at the surface, as the begonia seed is one of the finest. It is best to mix it with a little silver sand in order to sow it evenly over the pans or pots, and it is also best to water the soil *before* the seed is sown, so that it is not washed out. Keep the pots in a temperature of 60–70°, covering with a sheet of glass or paper. Wipe the glass daily, but keep the soil and air round the seeds moist until germination has taken place. Seedlings usually appear in about a fortnight, and the glass can then be removed, and seedlings given a little more light and air as they develop.

Plants grown from tubers are started into growth in February or March in shallow boxes containing loam, leaf-mould and sand. As soon as the tubers show shoots about $\frac{1}{2}$ in. long they are potted up into 4- or 5-in. pots, the soil for which should be very well-rotted manure one part, leaf-mould one part, loam three parts, and enough sand to make the whole porous. The quantity of sand varies according to the kind of loam used. A little soot and bone-meal can be added.

The plants are best grown on as cool as possible while they are under glass, and until the plants reach their final pots it is best to pick off flower buds. If they are being grown for the open garden they should not be allowed to flower until they have been finally planted out. Weak liquid manure given twice a week during the growing season is much appreciated.

Fibrous-rooted Begonias are for the most part grown throughout as greenhouse plants. They include a number of very showy hybrids, and also the large-leaved *Begonia Rex*, a plant grown for its ornamental foliage and easily increased from leaf cuttings. Some of the best modern bedding Begonias are as follows:—"Bath Bedder," rich crimson, 18 in.; "Burgomaster Max," crimson scarlet, dwarf; "Flamboyant," semi-double cerise.

Begonia crispa marginata, *Begonia fimbriata plena* and the crested single Begonias are also used for summer bedding.

CALCEOLARIAS.—The shrubby Calceolarias used for bedding are varieties of *C. integrifolia*. They include bright yellow and bronze shades. They are easily increased from cuttings and even in the garden where there is no greenhouse or frame they can be kept through the winter in the following manner:

Take the cuttings about September, pulling them off the plant with

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a "heel," or cutting them immediately below a joint. Prepare for their reception a hole sunk about 6 in. below the level of the border, at the bottom of which is soil well mixed with plenty of sharp sand. Dibble the cuttings into this, about 3 in. apart, and lay a sheet of glass over the top of the hole, level with the border surface. They can be left otherwise unattended all through the winter, and in spring will be found to have rooted, when they can be planted out or potted up as desired. In order to obtain bushy plants of even height, the growing tip of each rooted cutting is usually pinched out, so that side-shoots form. Good varieties for bedding are "Golden Gem" and "Camden Hero" (dark red brown).

CALOCEPHALUS.—*C. Browni*.—A distinct decorative plant, silvery in appearance, and popular for summer bedding. Easily increased by cuttings in spring.

CANNA (Indian Shot).—Fleshy-rooted plants with very vivid orange, yellow or red flowers. They are grown like Dahlias, that is, started into growth in heat in early spring and planted out at the end of May in the open garden.

They give a sub-tropical appearance to a formal bedding scheme. The name "Indian Shot" is given because of the seeds which are very hard. If the plants are raised from seed (which can be done quite easily), it should be soaked several days before sowing, or the outer shell may be filed off, to make germination more rapid.

COLEUS.—*C. blumei*, and its varieties are sometimes grown for bedding out because of the brilliant colouring of the leaves. They are easily raised from cuttings of young shoots in sandy soil in early spring.

COTYLEDON. See ECHEVERIA.

ECHEVERIA.—Fleshy-leaved plants, used for carpet bedding. Some have blue green, and others red or purple tinted foliage. Increased by sprouts or suckers detached in spring (or the fleshy leaves alone), and inserted in sandy soil, in heat.

EUCALYPTUS.—*E. globulus* is sometimes raised from seeds sown in heat in spring for use as a bedding plant in summer. It has aromatic foliage, greyish white in colour, and exceedingly ornamental.

FUCHSIA.—The slightly tender varieties of Fuchsia are used both for greenhouse decoration and for summer bedding. For bedding, cuttings are usually taken at the end of the summer. The old plants are also lifted, wintered rather dry in the greenhouse, cut back in spring, and restarted into growth by giving more heat and more water. Fuchsias like a steady supply of moisture and heat, and no sudden change. Periods of drought followed by rain are a frequent cause of bud dropping.

GAZANIA (Treasure Flower).—*Gazania pygmæa* is a half-hardy perennial useful in border and rockery. Cuttings should be taken in

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July or August, from the lower side shoots, and rooted in sandy soil in the cold frame, where they remain until the following May or June.

HELIOTROPIUM (Cherry Pie).—*H. peruvianum*. Though these plants can be grown from seed, it is much more common to raise them from cuttings taken each year. The cuttings can be taken in late summer but are more often taken in spring from the plants wintered in pots. The old plants can be grown on year after year if preferred.

MARGUERITE.—*Chrysanthemum frutescens*.—This is really a shrubby plant of 2 to 3 ft. in height. It is raised usually from cuttings of young shoots inserted in sandy soil in spring or autumn, and potted up in leafy loam. The plants appreciate a little artificial fertilizer occasionally. They are somewhat subject to attack from pests and when grown under glass have to be watched carefully. In the open, the worst pest is green-fly.

PELARGONIUM.—*P. Zonale*, the Zonal Pelargonium, is the popular "Geranium" of summer bedding schemes. It likes good loamy soil with sandy leaf-mould, and in pots it also appreciates occasional doses of artificial fertilizer or weak liquid manure. It is increased by cuttings of young shoots 2-4 in. long in spring, inserted in a frame, or by side shoots in July and August inserted in the open. By pinching out the centre of the plant, and the tips of young shoots, a bushy growth can be induced.

Plants for summer bedding are discouraged from flowering during the winter months, and any flower buds that appear are pinched off. They do not need a high temperature during the winter season, and if the greenhouse can be kept at about 40°, and well ventilated, Geraniums will be quite healthy through the worst weather. Ivy-leaved varieties are treated in exactly the same way as the ordinary bedding Geranium, but are rather more subject to attacks from insect pests.

"Paul Crampel" is still the finest of bedding varieties for a blaze of colour, but Geraniums are obtainable in many other interesting shades of pink, white, coral, crimson, etc.

SALVIA.—*Salvia patens* is grown for bedding out during the summer. The old plants are stored during winter in the greenhouse, and started into growth in spring by added warmth and moisture in order to develop young shoots. These are taken off when 2-3 in. long, rooted in sandy soil in a moist frame, and potted up singly later. They are planted out at the beginning of June.

VERBENA.—Fine hybrid forms of Verbenas are grown for summer bedding. Cuttings are taken in spring in the ordinary way from plants wintered in the greenhouse, and the plants are set out in June. During the summer the stems are pegged down as they grow, with the result that innumerable flower heads are formed, which provide sheets of colour all over the beds.

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RENOVATION OF OLD BORDERS

Sometimes a garden is taken over which already has an established herbaceous border. At any time when frosts are absent from the soil, between the months of September and March, such a border could be tackled by the incoming tenant and completely renovated. As this work is often a real problem to the novice we will describe it in detail.

The tools required for immediate use are a large digging fork with which to lift plants from the border, a heavy spade, and a trowel for replanting. With these will be required a wheelbarrow, and possibly some old sacks with which to cover the plant roots temporarily while they are out of the ground.

It is best not to lift more plants at once than can be replanted the same day, but in the case of a border which is to be completely remodelled it may be impossible to keep to this rule. If a large number of plants have to be lifted, therefore, they should be taken out, together with any soil that adheres round the roots in a ball, and laid on a vacant part of the garden with some moist soil thrown over the roots. If the garden is small, and there is no spare border available for treating the plants in this way, they can be laid on to the lawn, but it would be advisable in such a case to spread thick newspaper or sacks under the plants, so that the lawn does not get littered with loose stones and soil. As far as possible all the plant roots should be kept moist, and sheltered from frost during the time that they are out of the ground. If this is done it will not matter if the plants are not put back again for a week or two, though, as already stated, quick removal and replanting is the best.

The first step is to lift all the plants out of the soil and leave the border entirely bare. Next begin at one end by digging out a good wide trench, and taking the soil removed from it to the far end of the border where the digging will be completed. Break up the sub-soil with the large fork and turn the next width of soil over on to it. Keep raking back into the open trench any large stones or weeds, so that as you proceed down the border the surface is left tidy, level, and ready for the reception of the plants. Lime should be dusted on the surface after digging, using from 4 to 8 oz. per square yard. Bone-meal, which is such a useful fertilizer in the mixed border, should be dug in at the rate of 4 oz. to the square yard. The easiest way is to scatter the bone-meal over the soil surface before the digging is begun. In this way it will become mixed with the top soil. When the border has been completely dug the plants should be arranged according to plan.

It is in cases like these that a planting plan *on paper* is so useful, because it means that the plants can be much more quickly set out in their positions. As soon as the border is prepared they will be replanted

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just as in the case of a new border. Any plants that are known to be worthless varieties can be scrapped. *It takes as much garden labour and fertilizer to grow inferior varieties as to grow good ones.*

As an example of the use of various herbaceous plants of different sizes and colours in a mixed border, here is a list of plants which were successfully used in a border 8 ft. wide:

BACK ROW: Aster, Verbascum, Hollyhock, Heleri, Chrysanthemum max., Solidago, Rudbeckia.

SECOND ROW: Flag Irises, Delphiniums, Doronicums, Lupins, Sidalceas.

THIRD ROW: Oriental Poppy, Pyrethrum, Geranium ibericum, Anthemis tinctoria, Erigeron, Geum, Aquilegia.

FOURTH ROW (i.e. edging the lawn or path): Viola, Armeria, Pinks, Linum, Nepeta, Arabis, Aubrietia.

Perennials from Seed.—Almost all of the ordinary border plants, although perennial in nature and usually bought as plants, can be raised quite easily from seed sown outdoors about July. The best way to sow the seed is to prepare a nursery bed by deep digging and raking the surface very fine. The seed is sown in long lines leaving about eight inches between each, so that the hoe can be freely used to keep down weeds and break the soil surface during the time that the seedlings are small. Before the winter frosts arrive, the seedlings sown in this way will probably be large enough to transplant, either to permanent quarters, or to a position from 6 to 12 in. apart (according to size) in the nursery bed.

One point to remember with regard to perennial plants grown from seed is that the seedlings often vary considerably, and in many cases the majority of seedlings may be of an inferior type to the parent plants. The safest plan, therefore, is to plant the seedlings out in a nursery bed until they have flowered once. Any varieties not worth while can be consigned to the bonfire, and the others planted out during the autumn, after they have flowered, into their permanent positions in the border.

Seedlings of perennial plants can be raised equally well from seed sown under glass in the early part of the year, where frames and green-houses are available. The ordinary precautions for seed sowing as outlined in Chapter XVI will be taken, and as far as possible seedlings will be grown on under hardy outdoor conditions.

Such popular plants as Japanese Chrysanthemums, Dahlias, Delphiniums and Lupins are being more and more frequently raised from seed by amateur gardeners. The seedlings have the attraction of uncertainty; it is impossible to state beforehand whether the plants will be useless, or whether some rare and remarkable new variety will be discovered. In addition, plants so raised are always extra strong and

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vigorous, and, of course, a large stock of plants can be obtained more cheaply in this way than in any other.

Mixed Borders.—It is perhaps more appropriate to include the real mixed borders in this Chapter, than amongst either shrubs or annuals, for though the mixed border, the commonest feature of the small garden, can include a number of shrubs as well as annuals of all kinds, herbaceous perennials are usually most plentiful in its planting schemes. It is a place in which even half-hardy bedding plants can find a home.

The greatest advantage of the mixed border is perhaps that it allows a certain amount of permanent planting of shrubs to form a backbone. These are beautiful at all seasons, even in mid-winter. A group of ever-green shrubs covered with hoar frost, or splashed with snow, give line and form to the winter garden, and save it from the bare allotment-like look which it might otherwise have. It is possible, for instance, to put a series of small shrubs such as Veronicas, Pernettyas, Lavenders, Rosemary, Santolina, Senecio, Ceanothus, and dwarf Conifers, here and there along the border, and to interplant these with herbaceous perennials. The shrubs give quite a finished appearance to the border, when the others have died down.

Little groups of bulbs, such as spring-flowering Narcissus, and Crocus, summer-flowering Gladiolas, and autumn-flowering Schizostylis, can be set amongst the perennials, and even patches of annuals, sown where they are to flower, can be used. Fuchsias, Geraniums, and other tender plants wintered in the greenhouse can be put out, too, either to follow the spring bulbs when these are lifted, or to take the place of biennials as they fade. In this way a mixed border can be kept full of colour all the year round.

Only one thing need concern the amateur who ventures on this feature. Certain of the lime-hating shrubs can only be used if the soil of the border is naturally lime-free and kept so. In this case it would be impossible to grow most of the ordinary border flowers in close association, though a mixed border of say Rhododendrons with Lilies and dwarf Heaths could be arranged. In most cases, however, it will be better to exclude lime-haters from the mixed border, and only to introduce those shrubs and flowers which will grow healthily in ordinary garden soil.

SUGGESTED COLOUR SCHEMES FOR SUMMER BEDS

Ageratum (blue), with Alyssum maritimum (white).

Antirrhinum "Orange Glow," with Ageratum "Swanley Blue."

Antirrhinum "Enchantress" (pink), with "Maggie Mott" Violas (mauve).

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Begonia semperflorens (pink), with *Artemisia arborescens* (silvery leaves).

Begonia semperflorens (white), with *Lobelia* "Cambridge Blue."

Begonia, tuberous rooted (various), with *Alyssum maritimum* (white).

Calceolaria (pale yellow), with *Delphinium grandiflorum* "Blue Butterfly."

Calceolaria "Camden Hero" (brown), with *Phlox Drummondii* "Snowball."

Calendula "Orange King," with *Anchusa capensis* (blue).

Canna (scarlet), with *Centaurea gymnocarpa* (silvery leaves).

Cineraria maritima (grey leaves), with *Gladiolus brenchleyensis* (scarlet).

Dahlia "Coltness Gem" (scarlet), with *Viola* "White Swan."

Fuchsia "Ballet Girl" (red and white), with *Phlox Drummondii* (mixed varieties).

Geranium "Paul Crampel" (scarlet), with *Centaurea ragusina* (silver leaves).

Geranium "Madame Crousse" (pink), with *Antirrhinum* "White Queen."

Gladiolus "Flaming Sword" (scarlet), with *Antirrhinum* "Golden Queen."

Gladiolus "White Giant," with *Antirrhinum* "Orange Glow."

Godetia "Rosy Morn" (coral-pink), with *Dianthus chinensis* "Purity" (white).

Heliotropium "Lord Roberts," with *Calceolaria* (pale yellow).

Lobelia "Moonstone" (blue), with *Antirrhinum* "Yellow King."

Nicotiana (white), with *Fuchsia* "Ballet Girl" (red and white) and *White Alyssum*.

Nigella "Miss Jekyll" (blue), with *Verbena* "Miss Willmott" (rose).

Pentstemon "Southgate Gem" (carmine), with *Phlox Drummondii* "Snowball" (white).

Phlox Drummondii (rose and pink shades), with *Gaura Lindheimeri* (white, tinted red).

Salvia patens "Cambridge Blue," with *Sweet Alyssum* (white).

Salvia splendens "Harbinger" (scarlet), with *Statice Bonduelli* (yellow).

Tagetes erecta (orange), with *Lobelia* "Sapphire" (Sapphire blue).

Tropæolum "Golden Gleam" (yellow), with *Pentstemon* "Pink Beauty" (pink).

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PLANTS FOR COLOUR BORDERS

Perennials and Annuals

RED AND PINK SHADES	Height	Season of Flower
Althæa rosea	6-10 ft.	August to Sept.
Anagallis grandiflora	6 in.	Summer
Anemone fulgens	1 ft.	May to June
Anemone hepatica	6 in.	March to May
Anemone japonica	3 ft.	August to Sept.
Antirrhinums (various)	1-3 ft.	Summer
Armeria "Vindictive"	1 ft.	May to July
Aster (various)	2-5 ft.	Sept. to Oct.
Aubrietia rosea splendens	4-6 in.	Spring
Bellis perennis	6 in.	April to June
Centaurea dealbata	2 ft.	July to August
Cheiranthus cheiri	1-2 ft.	April to June
Chrysanthemum (various)	2-4 ft.	Summer and Autumn
Clarkia	2 ft.	July to Oct.
Cosmea	2½-6 ft.	June to Oct.
Dianthus caryophyllus	1 ft.	Summer
Dianthus plumarius	8 in.	June
Dianthus barbatus	1 ft.	Summer
Eremurus robustus	8 ft.	June
Erigeron B. Ladhams	2 ft.	May to Sept.
Gaura Lindheimeri	3 ft.	June to Oct.
Geranium (various)	1-3 ft.	June to Sept.
Geranium Endressii	1 ft.	May to Sept.
Geum	2 ft.	May to July
Godetia (various)	1 ft.	July to Oct.
Helenium	3 ft.	July to Oct.
Helichrysum	3 ft.	July to Oct.
Heuchera	1 ft.	July to Oct.
Iberis	1 ft.	July to Oct.
Kniphofia	2-2½ ft.	May to June
Lathyrus grandifolius	4-7 ft.	Summer
Lavatera olbia rosea	4-5 ft.	June to August
Lobelia cardinalis	2 ft.	Summer
Lupins (various)	1-4 ft.	June to Oct.
Lupinus polyphyllus (various)	3 ft.	June to Oct.
Lychnis	1 ft.	June to July
Lychnis fulgens	1 ft.	June to Sept.
Malope	2 ft.	June to Oct.
Malva moschata	2 ft.	Summer

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RED AND PINK SHADES (Cont.)		Height	Season of Flower
Nicotiana Sanderæ		1½-2½ ft.	August to Oct.
Pæonia (various)		2-4 ft.	May to July
Papaver orientale (various).		2-2½ ft.	May to June
Pentstemons (various)		1½-2½ ft.	June to Oct.
Phlox (various)		1-2½ ft.	July to Sept.
Phlox Drummondii		1 ft.	June to Oct.
Pinks		1 ft.	July to Oct.
Polygonum campanulatum		2-2½ ft.	Autumn
Poppies, Shirley		2 ft.	June to Sept.
Potentilla "Mill Willmott"		1½ ft.	June to Sept.
Salvia coccinea		1½-2 ft.	June to Sept.
Saponaria officinalis		1-1½ ft.	July to August
Saxifraga (various)		6-10 in.	May
Scabiosa atropurpurea		2-3 ft.	All Summer
Sedum spectabile		10 in.	Summer
Senecio elegans		1-1½ ft.	June to Oct.
Sidalcea, "Rosy Gem"		2½-3 ft.	June to Sept.
Silene (various)		9 in.	Summer
Spiræa palmata (various)		2 ft.	July to August
Stocks		1 ft.	July to August
Sweet Peas (various)		3-6 ft.	July to Oct.
Tropæolum (Nasturtium) (various)		1 ft.	July to Sept.
Verbena		1-2 ft.	July to Sept.
Veronica longifolia rosea		2-2½ ft.	June to August
Xeranthemum annuum		1 ft.	July to Sept.
Zinnia elegans		1 ft.	July to Sept.

BLUE SHADES

Anchusa capensis	10 in.	July
Anchusa italica	3-4 ft.	June to Oct.
Anemone apennina	9 in.	March to May
Aquilegia (various)	1-1½ ft.	May to July
Asperula azurea setosa	1 ft.	June to Sept.
Aster (various)	2-4 ft.	Summer to Autumn
Brachycome, Blue Star	10 in.	All Summer
Callistephus chinensis	2 ft.	Late Summer
Campanula carpatica	9 in.	June to Sept.
Centaurea cyanus	1½ ft.	July to Oct.
Centaurea montana	2-2½ ft.	July and August
Convolvulus minor	1 ft.	June to Sept.
Delphinium	5 ft.	July to August

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BLUE SHADES (<i>Cont.</i>)	<i>Height</i>	<i>Season of Flower</i>
Delphinium (Larkspur) . . .	1-2½ ft.	June to Sept.
Echinops ritro . . .	3 ft.	August and Sept.
Eryngium . . .	3 ft.	July and Sept.
Geranium grandiflorum . . .	1½ ft.	June to August
Iris germanica . . .	1 ft.	June
Lathyrus odoratus (various) . . .	3-6 ft.	July to Oct.
Linum usitatissimum . . .	2 ft.	July to Oct.
Lithospermum . . .	4 in.	May to Sept.
Lobelia (various) . . .	½-1 ft.	July to Sept.
Lupinus polyphyllus . . .	1½-3 ft.	May to July
Nemesia "Blue Gem" . . .	1 ft.	June to Sept.
Nigella "Miss Jekyll" . . .	1 ft.	June to Sept.
Phacelia campanularia . . .	9 in.	June to August
Salvia horminum . . .	1½ ft.	July to Sept.
Salvia pratensis Tenorii . . .	2 ft.	June to Oct.
Scabiosa caucasica . . .	1½-2 ft.	June to Sept.
Statice . . .	1-2 ft.	June to August
Statice sinuata . . .	1½ ft.	June to Oct.
Tradescantia virginiana . . .	1½ ft.	June to Sept.
Verbena (various) . . .	1-2 ft.	July to Sept.
Veronica longifolia . . .	1 ft.	July to Sept.
Violas (various) . . .	6 in.	All Summer

PURPLE, MAUVE, LILAC AND VIOLET SHADES

Althæa rosea (various) . . .	6-10 ft.	August to Sept.
Alyssum maritimum . . .	6 in.	Summer
Aquilegia (various) . . .	2 ft.	May to July
Aster . . .	2-6 ft.	Sept. to Oct.
Aster, China . . .	1-2 ft.	Autumn
Aubrietia (various) . . .	3-4 in.	Sept. to Oct.
Campanula latifolia macrantha . . .	2-4 ft.	June to July
Candytuft . . .	1 ft.	July to Oct.
Chrysanthemum (various) . . .	3 ft.	Autumn
Clarkia elegans . . .	2 ft.	July to Oct.
Delphiniums (Larkspur) (various) . . .	2-3 ft.	June to Sept.
Delphinium (various) . . .	3-6 ft.	July to Sept.
Galega officinalis . . .	2½-3 ft.	July to Sept.
Geranium (various) . . .	1-3 ft.	June to Sept.
Gilia tricolor . . .	10 in.	June to Oct.
Heliotropium peruvianum (various) . . .	2 ft.	May to Sept.
Linaria purpurea . . .	1-2 ft.	June to Oct.

COMPLETE GUIDE TO HOME GARDENS

PURPLE, MAUVE, LILAC AND

VIOLET SHADES (*Cont.*)

	<i>Height</i>	<i>Season of Flower</i>
<i>Linaria</i> (various) . . .	1½ ft. . .	July to Oct.
<i>Lupinus</i> (various) . . .	2½–3½ ft. . .	May to July
<i>Lupins</i> (various) . . .	1–3 ft. . .	June to October
<i>Lythrum virgatum</i> . . .	3 ft. . .	Summer
<i>Malcomia</i> . . .	8 in. . .	July to Oct.
<i>Nemesia versicolor</i> . . .	1 ft. . .	June to August
<i>Nepeta mussini</i> . . .	1 ft. . .	May to Oct.
<i>Nigella damascena</i> . . .	1½ ft. . .	June to Sept.
<i>Petunia</i> (various) . . .	1–2 ft. . .	June to Sept.
<i>Phlox</i> (various) . . .	2½ ft. . .	July to Sept.
<i>Prunella Webbiana</i> . . .	1 ft. . .	Summer
<i>Scabiosa atropurpurea</i> . . .	2–3 ft. . .	All Summer
<i>Statice latifolia</i> . . .	2 ft. . .	July to Sept.
<i>Statice sinuata</i> . . .	16 in. . .	August to Sept.
<i>Stocks</i> (various) . . .	1 ft. . .	July to August
<i>Sweet Pea</i> (various) . . .	3–6 ft. . .	July to Oct.
<i>Sweet Sultan</i> . . .	2 ft. . .	July to Oct.
<i>Verbascum phoeniceum</i> . . .	1½ ft. . .	July and Sept.
<i>Verbena</i> (various) . . .	1–2 ft. . .	July to Sept.
<i>Viola cornuta</i> (various) . . .	6 in. . .	Spring and Summer
<i>Viola</i> (various) . . .	6 in. . .	All Summer
<i>Xeranthemum annum</i> . . .	1 ft. . .	July to Sept.

YELLOW AND ORANGE SHADES

<i>Achillea millefolium</i> , Parker's var.	4 ft. . .	June to Sept.
<i>Alstroemeria aurantiaca</i> . . .	2–3 ft. . .	August to Sept.
<i>Anthemis tinctoria</i> . . .	1–2 ft. . .	June to August
<i>Antirrhinum</i> . . .	1–3 ft. . .	June to Sept.
<i>Aquilegia canadensis</i> . . .	1–2 ft. . .	May to July
<i>Artemisia stelleriana</i> . . .	1 ft. . .	August to Sept.
<i>Asclepias tuberosa</i> . . .	1–2 ft. . .	July to Sept.
<i>Asphodeline lutea</i> . . .	3–5 ft. . .	August
<i>Aster lutea</i> . . .	2–3 ft. . .	Sept. and Oct.
<i>Bartonia aurea</i> . . .	1 ft. . .	July to Sept.
<i>Bupthalmum salicifolium</i> . . .	1–2 ft. . .	July to Oct.
<i>Centaurea macrocephala</i> . . .	3–5 ft. . .	July to August
<i>Centaurea</i> (Sweet Sultan) . . .	1–2 ft. . .	July to Sept.
<i>Cephalaria tartarica</i> . . .	5–6 ft. . .	June to August
<i>Chrysanthemum</i> (various) . . .	1–2 ft. . .	June to Oct.
<i>Coreopsis</i> . . .	18 in. . .	June to Sept.

POPULAR HERBACEOUS PERENNIALS

YELLOW AND ORANGE

SHADES (<i>Cont.</i>)	<i>Height</i>	<i>Season of Flower</i>
Corydalis lutea	1 ft. . . .	April to Sept.
Dahlia (various)	4-6 ft. . . .	August to Oct.
Delphinium sulphureum	3-5 ft. . . .	September
Doronicum plantagineum excelsum	3-5 ft. . . .	March to Aug.
Eremurus	3-5 ft. . . .	June and July
Eschscholtzia	1 ft. . . .	June to Sept.
Gaillardia	1-2 ft. . . .	July to Sept.
Gaillardia	18 in. . . .	July to Oct.
Geum Lady Stratheden	1-2 ft. . . .	June and July
Helenium (various)	1-5 ft. . . .	July to Oct.
Helenium autumnale	4-6 ft. . . .	August and Sept.
Helianthus (various)	3-10 ft. . . .	Summer
Heliopsis (various)	3-5 ft. . . .	July to Oct.
Hemerocallis	2-3 ft. . . .	July and August
Hollyhocks	8-10 ft. . . .	July to Sept.
Inula (various)	1-6 ft. . . .	May to Oct.
Iris (various)	2-4 ft. . . .	June and July
Kniphofia	1-2 ft. . . .	August to Sept.
Lilium tigrinum	3-5 ft. . . .	July to Sept.
Linaria "Golden Gem"	9 in. . . .	June to Sept.
Lupinus arboreus	2-3 ft. . . .	July
Marigolds, French, African, and Pot	1-3 ft. . . .	June to Oct.
Meconopsis cambriæ	1 ft. . . .	June to August
Montbretias	2-3 ft. . . .	July to Sept.
Phlomis	2-3 ft. . . .	June
Rudbeckia (various)	2-6 ft. . . .	July to Sept.
Senecio Clivorum "Othello" . .	3-4 ft. . . .	July to Sept.
Solidago	2-6 ft. . . .	August to Sept.
Thalictrum glaucum	5-6 ft. . . .	June to July
Trollius asiaticus	1-2 ft. . . .	July to August
Trollius europæus	1-2 ft. . . .	June
Tropæolum (Nasturtiums) (various)	1-4 ft. . . .	June to Oct.
Verbascum olympicum	5-6 ft. . . .	July to Sept.

WHITE SHADES

Achillea Ptarmica, "The Pearl" .	1-2 ft. . . .	July and August
Aconitum napellus album	3-5 ft. . . .	May to July
Anemone japonica alba	2-4 ft. . . .	September
Anthemis Cupaniana	1 ft. . . .	June to August
Anthericum liliago	1-2 ft. . . .	June
Antirrhinum (various)	1-3 ft. . . .	June to Oct.

COMPLETE GUIDE TO HOME GARDENS

WHITE SHADES (<i>Cont.</i>)	<i>Height</i>	<i>Season of Flower</i>
Artemisia lactiflora . . .	4-6 ft. . .	Sept. to Nov.
Aster (China) . . .	15 in. . .	August to Sept.
Aster (various) . . .	2-5 ft. . .	Autumn
Bocconia cordata . . .	4-8 ft. . .	June to Sept.
Campanula (various) . . .	$\frac{1}{2}$ -4 ft. . .	June to August
Chrysanthemum (various) . . .	1-2 ft. . .	June to Oct.
Chrysanthemums (various) . . .	2-6 ft. . .	June to Oct.
Cimicifuga japonica . . .	2-4 ft. . .	July and Aug.
Clarkia . . .	2 ft. . .	July to Oct.
Cornflower . . .	18 in. . .	July to Oct.
Cosmea . . .	3 ft. . .	Aug. to Sept.
Crambe cordifolia . . .	3-5 ft. . .	June and July
Dictamnus fraxinella albus . . .	2-3 ft. . .	May to July
Eremurus himalaicus . . .	5 ft. . .	June
Galtonia candicans . . .	3-5 ft. . .	July and Aug.
Godetia . . .	2 ft. . .	July to Sept.
Gypsophila elegans . . .	2 ft. . .	June to Sept.
Gypsophila paniculata . . .	2-4 ft. . .	June to Sept.
Iris (various) . . .	1-5 ft. . .	May to July
Lilium (various). . .	2-6 ft. . .	June to August
Lupinus polyphyllus, various . . .	2-4 ft. . .	June and July
Nicotiana . . .	2 ft. . .	July to Sept.
Nigella "Miss Jekyll White" . . .	18 in. . .	June to Aug.
Pæonia (various) . . .	2-4 ft. . .	June
Petunia . . .	12 in. . .	July to Sept.
Phlox (various) . . .	2-4 ft. . .	July and Aug.
Physostegia virginiana alba . . .	4-6 ft. . .	July to Sept.
Polemonium cœruleum album . . .	1-2 ft. . .	May
Polygonatum . . .	2-4 ft. . .	June and July
Poppy, Double White Shirley . . .	2 ft. . .	July to August
Pyrethrum (various) . . .	2-4 ft. . .	June
Rheum palmatum . . .	6-10 ft. . .	July
Romneya coulteri . . .	2-4 ft. . .	June to Sept.
Scabiosa caucasica alba . . .	18 in. . .	Summer
Sidalcea candida . . .	2-3 ft. . .	May to June
Spiræa aruncus . . .	3-5 ft. . .	June to July
Stocks . . .	12 in. . .	July to Sept.
Sweet Sultan . . .	18 in. . .	July to Sept.
Veronica gentianoides . . .	1 ft. . .	April to June

POPULAR HERBACEOUS PERENNIALS

THE YEAR IN THE FLOWER GARDEN

January

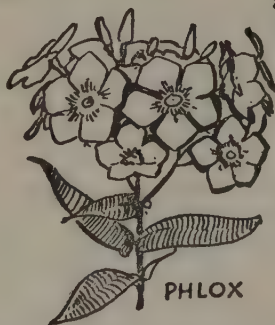
COMPLETE all path-making and construction of archways, pergolas, etc.

Prepare labels, seed-pans, and boxes. Seeds which take some time to reach maturity should be sown under glass. The best seed gives the most double flowers.

PERENNIALS



COLUMBINE



PHLOX



DOUBLE AND SINGLE
HOLLYHOCKS

When buying perennials, do not be content with the old varieties if there is a newer one with better colouring or habit of growth

Seeds should be ordered early, and wisely; a little of the best quality gives better results than a large quantity of inferior seed, of which a good deal is wasted.

Soil round plants which has been loosened by frost should be pressed back.

Dried leaves can be used among dwarf Roses and bulbous plants and over the crowns of Delphiniums, Peonies, Pyrethrums, etc., as a protection from severe frosts.

Trim Laurel hedges.

Keep lawns rolled, unless the weather is very wet.

Manure in a dry crumbly condition makes a fine mulch for Peonies. Pile it round the crowns and leave it to be washed in by rains.

COMPLETE GUIDE TO HOME GARDENS

February

As soon as the weather turns warm, begin to use the mower on the lawn.

Herbaceous plants should be divided and replanted whenever there is a favourable opportunity.

New Delphiniums should be planted this month.

Place Dahlia tubers in boxes under cover. Sprinkle them with soil, and a little water, to encourage new shoots.

Stir the surface soil of bulb beds with a fork.

China Asters, Balsams, Phlox Drummondii, Lobelia, Stocks, Tobacco plants, and all other half-hardy annuals to be used for summer beds and borders should be sown in boxes in the warm greenhouse.

Plant out autumn-rooted cuttings of Carnations, 12 in. apart each way.

Divide Polyanthus and Primrose.

Lily-of-the-Valley crowns should be planted where they can remain undisturbed. They like to run alongside a wall.

Lift and divide Montbretias, if this was not done in November.

Plant Honeysuckle, Jasmine, Virginian Creeper, Clematis and other climbing shrubs.

Sow Sweet Peas in small thumb pots in the frame.

March

Sow Dahlia seed under glass.

Hardy annuals such as Clarkias, Larkspur, Malope, Mignonette, Nigella, Californian Poppy can be sown.

All Rose planting should be finished immediately. Prune, train, and tie up climbers.

Sow Sweet Peas outdoors. Transplant Pansies, Violas and Snapdragons into their flowering quarters. Violas are effective as a carpet under dwarf Roses. Plant 6 in. apart.

Plant hardy flowers such as Delphiniums, Coreopsis, Carnations, Pinks, Gladioli, etc.

Stir the soil amongst spring flowers.

Remember to sow flowers in rows, specially for cutting. This means less robbery of the borders.

During the last week of March, Roses may be pruned in the South of England. Prune strong-growing kinds lightly, and weak ones more severely.

Tea Roses should be left until the first week in April, as they are more tender than hybrid perpetuals, and new growths are therefore more likely to be injured by frosts.

After flowers fade, bulbs in bowls will still need some water. Plant them out in an odd corner of the garden.

POPULAR HERBACEOUS PERENNIALS

April

Prune Roses in the North of England and Scotland during the first fortnight of the month.

Hardy annuals and biennials may now be sown in the open border. Sow thinly.

Prick out seedlings of half-hardy annuals. After a week allow them all the air and sun possible, closing the frames before dusk in case of frosts.

Plant out rooted cuttings of *Antirrhinums*, *Pentstemons*, and *Violas*.

Pinch out the tips of the *Antirrhinums* to make them bushy plants of even height.

Plant *Gladioli*, interplant with dwarf, bushy or carpet plants, such as *Sweet Alyssum* or *Phlox Drummondii*.

Finish all lifting and division among herbaceous plants.

Hardy Lilies can be planted, also *Begonias* and *Cape Hyacinths*.

Sow seeds for summer fragrance—*Sweet Alyssum*, *Balsam*, *Sweet Pea*, *Night-scented Stock* and *Mignonette*.

Sweet Peas need support. For the vases they are best grown in rows. Twiggy hazel stakes are good supports.

Lift and replant *Snowdrops* where too crowded.

Divide *Kniphofias* if necessary.

Prepare for summer bedding. Lift bulbs and dig over the beds and borders.

May

Lift the early spring bulbs carefully and replant them in an odd corner of the garden to die down naturally. They will then flower again next season.

Hyacinths and *Tulips* can be treated in this way. *Daffodils*, *Snowdrops*, *Crocuses*, *Scillas* and *Muscari* may be left in the ground undisturbed.

Flower beds not manured in the autumn should be dressed with well-rotted manure now. This should be well forked in before any planting is done.

If manure is not obtainable, use 3 oz. to the square yard of the following mixture: 1 lb. each of sulphate of ammonia and sulphate of potash; with 3 lb. of superphosphate of lime. Fork this into the top soil.

Sweet Alyssum, *Antirrhinums*, *Stocks* and *Larkspurs* should be transplanted from the cold frame. Distance apart depends on the height of the mature plants. Annuals grown for mass effect can be left unthinned.

Bedding plants, such as *Geraniums*, *Calceolarias*, *Lobelia*, etc., should be hardened by allowing as much light and air as possible. *Gladioli* may still be planted.

COMPLETE GUIDE TO HOME GARDENS

Prepare borders for bedding plants, and bed out as weather permits.

Spring perennials like Primroses, Polyanthus, Daisies and Aubrietia can be lifted to make way for the summer flowers. Divide up the old plants and set in a reserve part of the garden to grow on during the summer.

Plant out Dahlias at the end of the month if the weather is favourable. Star Dahlias make good bedding plants for massed colour effect.

Sow biennials. Sow the seeds in the open garden in drills 12 in. apart. Seeds for present sowing are Canterbury bells, Honesty, Wallflowers, Evening Primrose, Foxgloves, Brompton Stocks, Forget-me-nots. Sow perennials such as Coreopsis, Delphiniums, Lupins and Geum.

Stake herbaceous plants.

Mulch Hollyhocks if the soil is inclined to be dry.

Plant Chrysanthemums.

Sow Wallflowers in boxes or in the open.

Dust Roses affected with mildew with flowers of sulphur.

Give weak liquid manure to wall fruits.

Sow Sweet Peas in the open for succession.

June

Plant out Dahlias in well-manured soil. Roses are all in flower during this month and next, and need occasional doses of liquid manure. Apply when the soil is wet, after a shower or after watering.

When cutting Rose blooms sever the stem low down. This makes finer blooms in the second crop.

Watch for mildew on Roses. Spray with liver of sulphur, or dust flowers of sulphur over the plants.

Thin out hardy annuals ruthlessly, as crowded plants never give the best results.

Stake Carnations.

Give support to such flowers as Shirley Poppies and Cornflowers. A few twigs will be sufficient.

Newly-planted seedlings of half-hardy annuals may need water if the weather is dry.

Early perennials should be cut down as the flowers fade, the roots being mulched with manure and watered.

Most of the biennials and hardy perennials, such as Pansies, Hollyhocks and Delphiniums, can be sown in a shady part of the garden. Sow thinly, in shallow drills, allowing room to use the hoe.

Keep down weeds by hoeing.

Seeds to be sown this month include Anchusa, Aubrietia, Aquilegia, Coreopsis, Chrysanthemum maximum, Cheiranthus, Delphinium, Gail-lardia, Iberis, Linum, Lupin, Lychnis, Phlox, Statice, Sweet Rocket, Honesty, Wallflowers.

POPULAR HERBACEOUS PERENNIALS

July

Bud Roses.

Sow seeds of biennials in the open border or in the cold frame, and when they are a few inches high transplant them to their permanent position, leaving 8-12 in. between the plants.

Plant Colchicums.

Sow Primulas and Meconopsis.

Layer Carnations in the border.

Perennials like Delphiniums, Phloxes and Anchusas will give a second crop of flowers if faded blooms are removed. Take cuttings of Hollyhocks.

Ivy cuttings inserted in the cold frame will root readily this month.

Lift Tulips and dry them.

Irises can be lifted and replanted, *if the soil is moist*.

Gather Sweet Peas regularly to prevent seed-pods forming. Hoe the soil round the plants.

Stake autumn-flowering plants such as Sunflowers, Heleniums, Michaelmas Daisies.

Pansies may be sown outdoors.

Feed Roses with liquid manure diluted to a pale straw colour to produce a second crop of flowers.

Increase Pinks by "pipings," i.e. short pieces pulled out at a joint and inserted as cuttings. Insert in sandy soil and keep moist.

Take cuttings of all the early-flowering carpet plants such as Arabis, Aubrietia, etc. Pieces pulled out and inserted in sand, with no preparation, will root readily if kept moist overhead.

Sow seeds of perennials such as Chrysanthemum maximum, Lupins, etc., in lines in a shady border, and transplant when large enough to handle.

August

Sink all room plants to their rims in a shady border during absence on holiday.

Carnations layered last month will need water in dry weather. Insert cuttings in sandy soil in the cold frame. Keep them close for some time, only opening the lights morning and evening. They will root in a few weeks, and can then be left exposed to all weathers.

Early-sown biennials may be ready for transplanting to their permanent position.

Bud Roses.

Pansy and Viola seedlings can be transplanted to the borders as soon as they are large enough to handle. They will flower a little all winter.

Prick out Polyanthus seedlings in a half-shady border.

Hollyhocks and other perennials raised from seed must be kept free

COMPLETE GUIDE TO HOME GARDENS

from weeds. Transplant them in showery weather where they are to flower next year.

Spring bulbs should be potted from now onwards. Good kinds for forcing are Tulips and Hyacinths.

Madonna Lilies, where overgrown, can be moved from one position to another now. Prepare the soil by deep digging, adding plenty of leaf-mould *and lime*.

Show Dahlias should be disbudded and staked. Earwig traps should be set.

Lavender hedges may now be trimmed.

Sweet Peas should be fed with weak doses of liquid manure.

September

Make new lawns from seed.

Plant Peonies in soil that is deeply dug and contains plenty of manure as well as some lime. The manure should be well rotted, and should not come into direct contact with the roots.

Remove all seed-pods and dead flowers.

Take Viola cuttings and insert in boxes of sandy soil. Heavy, sticky soil is fatal to the cuttings.

Pansies and Violas for spring bedding should be planted now in their permanent quarters.

Hollyhocks, Lupins, Coreopsis, Chrysanthemum maximum and other perennials raised from seed should now be ready for transplanting to the borders.

New herbaceous borders should be prepared this month by digging deeply, incorporating manure at the same time. Bonemeal should be used on shady borders instead of animal manure.

During the month examine the ties of budded Roses and loosen them where necessary.

Trench new Rose beds for planting in November.

Dahlias should be tied up, disbudded, and thinned. Earwigs should be trapped and choice blooms protected from the sun's rays.

Divide and replant Primroses, Polyanthus and border Auriculas.

Plant out biennial and perennial seedlings to their winter or flowering quarters. They can be transplanted again in spring if necessary.

Plant English and Spanish Irises in beds.

Keep beds and borders tidy by removing dead annuals.

Lift Gladioli that have done flowering, tie in bunches and hang up in a shed to dry.

Trim back old shoots that have flowered, and tie in new shoots of climbing Roses.

Plant out Double Daisies, Honesty, Forget-Me-Nots, and Silene.

POPULAR HERBACEOUS PERENNIALS

Plant Anemones, Crocuses, Montbretia, Narcissi, Snowdrops, Chionodoxas, Scillas, etc., but not Tulips.

Take cuttings of Ageratums, Antirrhinums, Blue Marguerites, Centaureas, Fuchsias, Gazanias, Lobelias, Zonal Pelargoniums, Heliotropes, Pentstemons, Petunias, and Roses.

Rooted layers of Carnations may now be planted out.

October

As soon as Dahlia tops have been cut down by frosts, lift the tubers. Dry and clean them before storing.

Lift Gladiolus corms, tie them in bunches and hang in a frostproof shed for the winter.

Herbaceous plants of all kinds can be planted now.

Old-established borders can be renovated where necessary.

All half-hardy bedding plants should be taken from the ground and put under glass for the winter.

Summer-sown flowers should be planted out at the same time that bulb planting is done. Plants that are useful for carpeting the ground of bulb beds are *Silene Compacta*, *Polyanthus*, *Arabis* and *Aubrietia*, Double Daisies, *Cerastium*, Pansies and Violas.

All spring-flowering bulbs can be planted this month, including Daffodils, Hyacinths, Crocuses, Snowdrops, Fritillarias, Lilies, Grape Hyacinths, etc.

If the mixed border needs renovating, lift out every plant, leaving a ball of soil intact round the roots, so that those plants which do not need division are disturbed as little as possible. Dig a trench in another part of the garden and heel the plants into this while the border is dug.

Peonies can still be divided and replanted in good soil.

Bush Roses planted now give better results than those planted in spring. Plant in deeply-dug and well-manured soil.

Biennials such as Wallflowers and Forget-Me-Nots should be planted out in their permanent positions, if possible.

Withhold water from tuberous Begonias in pots, dry off and store in boxes in a frostproof situation.

Lift Begonias and Cannas from the summer beds.

Transplant *Anemone Japonica*, and *Papaver Orientalis*, if necessary. They do not like disturbance too frequently.

Sow Sweet Peas for early flowering. Dig and manure ground intended for Sweet Peas next season. Leave the surface rough.

Divide and plant out Montbretias in open borders.

Winter Aconites may be planted, or propagated by offsets, now.

Cuttings of Pentstemons, *Anagallis*, *Calceolarias*, Periwinkles, Phloxes, Salvias, Roses can now be struck.

COMPLETE GUIDE TO HOME GARDENS

Lay new turf.

Finish mowing for the season and top-dress lawns with fine soil and decayed manure.

November

Dress with lime over the soil after digging.

Immediate plantings can be made in mild weather of Wallflowers, Polyanthus, and Darwin Tulips.

Sweet Peas can be sown in pots and kept under glass till the spring.

Open out trenches for exhibition Sweet Peas next year. Trenches should be at least 18 in. deep, preferably 2 ft. Loosen the bottom soil and leave the trenches open until Christmas.

Order farm manure. Keep all the leaves and other vegetable refuse stored in a heap or pit to be dug into land that has a tendency to dry out.

Lift Dahlias and Gladioli if not already done. Store in dry, frost-proof shed or attic. Protect all plants of doubtful hardiness.

Plant Tulips.

Plant Peonies in deeply-trenched and well-manured ground.

Pansies may be potted off as a reserve for filling up vacancies or for making new beds in the spring.

The Spanish and English Iris may still be planted outdoors. Lilies of the Valley, Anemone (tubers), Canterbury Bells, Primroses, Pansies, Sweet Williams, Violets and Wallflowers may still be planted.

Cuttings should be sorted over; those which require similar treatment during the winter should be placed together in separate frames.

Plant Roses, but only when the ground is fairly dry. If the soil is too wet, heel in the new trees and await a favourable opportunity for planting.

December

Plant Roses in open in dry weather.

Shelter beds of bulbs by a mulch of litter over surface.

Press back young plants into the soil after each severe frost.

Protect Christmas Roses and Iris *stylosa* with hand-lights.

Look over bulbs and tubers in store. Remove any that appear to be diseased and destroy them.

Sweep and roll lawns occasionally.

Collect all rubbish and burn it. When the ground is hard, manure may be wheeled from one part of the garden to another as required.

If bulbs send up leaves, the surface soil should be forked between them, and dried bracken or litter put over the beds.

Use coarse sand or cinders to protect Liliums and Tea Roses from frost.

Dig deeply all empty beds and borders and leave them rough to weather.

CHAPTER IV

FLOWERS FROM SEED—USE OF ANNUALS AND BIENNIALS, ETC.
—LIST OF POPULAR KINDS—COLOUR SCHEMES IN ANNUAL
BORDERS

FLOWERS FROM SEED

RAISING your own plants from seed forms quite half the fascination of gardening. Plants bought from the nurseryman may give magnificent results, but they can never be so interesting as those which you have tended since they were tiny seeds.

THE SOIL

The first step in seed sowing is to prepare the soil. Although this looks dead, it is really full of different organisms, some of which help and some harm the plants. The gardener's job is so to cultivate his soil that the helpful organisms are encouraged and the harmful ones checked.

In a water-logged soil, deep digging is sometimes sufficient to disperse the water and make the garden more fertile. This means digging to a depth of two feet, thoroughly breaking up the subsoil, and if necessary working in decayed leaves and strawy manure. If manure is not available, house or garden refuse is a good substitute.

Heavy soils should be dug in the winter and left rough for the frosts to make them friable. If a dressing of lime is given in the early spring, about two to four ounces to the square yard, the site will only require a final raking to make it ready for seed sowing.

Light soils need to have moisture-retaining materials such as heavy manure, decayed leaves and vegetable refuse incorporated when digging to make them better suited to seed sowing. Seedlings in light soils need a little artificial feeding during the growing season, but these soils are warmer in winter than clayey soil and therefore young seedlings have a better chance of success.

New gardens are frequently covered with turf, and if this is stripped and buried with the broken-up subsoil it will help to retain moisture. The main thing to remember is to keep the fertile top soil on top and not to bring the unfertile subsoil to the surface.

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THE SEED

It always pays to buy seed from a reliable firm, as it is very disappointing to spend time and money on seed raising and to have a large percentage of failures. Seedsmen are now compelled by Act of Parliament to stamp all packets of vegetable seeds with the name and address of the seller, the percentage of purity if below 97, the season and the percentage of germination. The larger seed firms devote a portion of their grounds simply to the testing of the percentage of purity of the seed, and also have special machinery for testing seeds for germination percentage and freeing them from all weed seeds.

The main things necessary before germination can take place are water, which has to be absorbed by the seed, and then a certain degree of heat. These start the process of the absorption of the stores contained in the seed followed by the growth of the root and shoot, by which time the seed must have light and nourishment outside itself if it is to grow into a healthy plant.

It is interesting to know that all seeds do not germinate in the same length of time. Age will affect this. Last year's seeds as a general rule take longer to germinate than fresh seed, although of course there are exceptions, especially amongst the shrubs. Some shrub seeds take quite two or three years to germinate. Many experiments have been made to test what is called the longevity of seeds. It has been found that where seed may not germinate when sown a year old, it will possibly germinate if sown when three or four years old. *Aquilegia* seeds usually germinate fairly well after two years and give a hundred per cent. at four years, but after five years there is no germination at all. It is best therefore to buy fresh seed each year for your main displays or crops, but if you have any seed left over from previous years, try it out in some odd corner of the garden and you may reap quite a good harvest. This delay in germination shows a wise provision of Nature to meet possible ravages by pests or droughts.

Other reasons for a poor percentage of germination are that some seeds are harder than others. This means that they cannot absorb moisture very readily, and unless chipped before sowing they may lie dormant for long periods. Also seed may be harvested before it is really ripe, and if so it germinates slowly and the resultant seedlings are poor. There are several ways in which seed could be of poor quality if seedsmen did not take the trouble to harvest and test them with care.

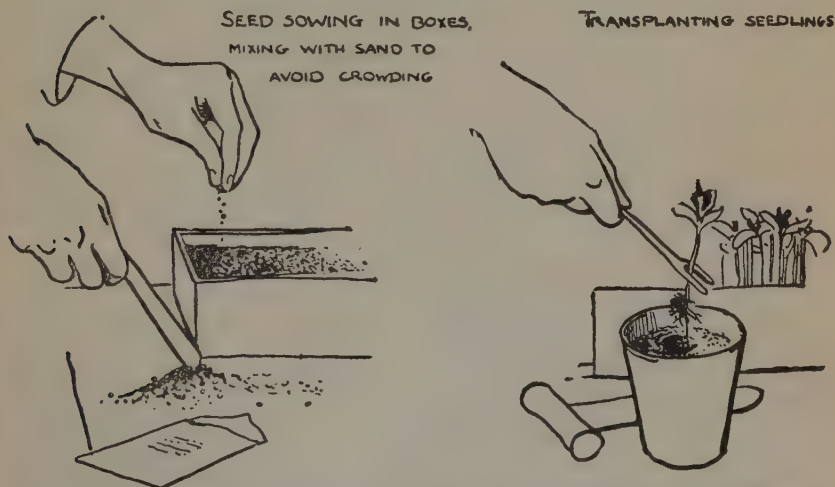
SOWING THE SEED

March and April are the great seed-sowing months out of doors. This is because the ground is usually friable after the frosts and ready to be raked down to a fine tilth. Also the April showers and sunshine provide

FLOWERS FROM SEED

the ideal moisture and heat necessary for quick and satisfactory germination.

Some seeds are so tiny that it is very difficult to sow them thinly. A good plan is to mix a little sand with the seeds before sowing, or to make a tiny hole in the corner of an envelope containing the seed so that they drop out one by one. It is most important to sow the seed thinly, otherwise the plants have to be thinned out drastically, with a consequent waste of seed, or else they are left unthinned and eventually smother each other so that no plants reach perfection. When sowing groups of annuals in the flower border, it is best to put a tiny pinch of seed



Seeds are sown in boxes for convenience of handling and protection from pests. They need light and air to prevent damping off. Transplant as soon as large enough to handle

in at 9- to 12-in. intervals. The strongest seedling can then be saved from each group, and very few are wasted.

Children and also some grown-ups bury their seeds much too deeply. The tiny seeds need hardly any covering. It is really sufficient if the soil is just patted down firmly after sowing. A good general guide is to cover the seed with twice its depth of soil.

Seeds which are too tender to be sown directly into the ground can be raised in boxes either in January or February or early March. See that the boxes, which need only be one inch or so in depth, have a few holes bored in the bottom for drainage. Place a few broken crocks over these to prevent soil from blocking them, and then fill the boxes with fine soil. Ordinary garden soil to which a little sand has been added to lighten it is quite suitable for the majority of half-hardy annuals. Seeds

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such as sweet peas, which may be some few weeks in the boxes, should be grown in slightly richer soil. Decayed leaves mixed with the sand and garden soil is sufficient.

Sow your seeds as thinly as you can and label them and then place them in the greenhouse or cold frame. If you have neither of these, a sheet of glass put over the boxes stood out of doors is quite satisfactory and sufficient to keep away frosts.

CARE OF THE SEEDLINGS

Your seeds will now need systematic attention if they are to grow into healthy plants. Water them through a fine rose directly after sowing. Water very little if the weather is cold, and use tepid water. If the weather turns warm, more water will be required. If they are made too damp they "damp off," and if too dry they will receive a severe check from which they may not recover. Seeds out of doors can usually be left to the spring rains to keep them satisfactorily supplied with moisture. When the seedlings have formed to seed leaves it is time for them to be moved and given more room. This job needs to be done very carefully, for if the young roots are damaged the seedlings are spoilt.

PRICKING OFF

A cleft stick is the best tool to use. The seedling is gently lifted with a little soil left attached to its root, and held in position in its new hole, while soil is pressed against the roots. When seedlings are pricked off in this way they are transferred to a box containing similar soil to the first, but they are spaced out in rows a few inches apart. Do not discard any seedlings, for the smallest seedlings often make the strongest plants. They do not receive such a check from their move as the larger seedlings. The boxes should be returned to the cold frame and ventilation given whenever the weather permits. The glass must always be put on at night until there is no fear of frosts. As the weather gets warmer the lights are gradually left off altogether to "harden off" the seedlings ready for transplanting to their permanent quarters in the garden.

TRANSPLANTING

This transplanting process is a very important part of the work of raising plants from seeds. Great care must be taken not to damage the little roots or to bruise the stems. This is avoided by using a small stick for tiny seedlings and a larger one or dibber for larger plants such as sunflowers. The procedure is to tap the box sharply on the ground at one end to loosen the soil. A batch of seedlings with the soil attached can then be lifted out and the plants gently separated from each other. As large a ball of soil as possible should be left round the roots of each

FLOWERS FROM SEED

seedling. Hold the seedling in the left hand and with the stick make a hole large enough to take the roots without cramping them in any way. Drop the seedling into position, holding it so that the first pair of leaves is just above the soil level. Push the stick into the soil $\frac{1}{2}$ -inch away from the plant and gently lever it over so that the soil is pushed against the roots without the stick actually coming into touch with them. Make sure that the seedling is firmly planted and then water overhead through the fine rose of a can. Shade them from bright sunshine for the first few days by means of a cloche, although if they are watered each evening after sundown they should get away quite well without being shaded.

If you are planting seedlings out in formal rows, as for example antirrhinums in a formal bedding scheme, it is a good plan to scatter a little sand over the surface of the bed. Then stretch a line across where the

SEED SOWING IN THE OPEN



SMALL SEED BEDS IN THE HERBACEOUS BORDER



RAKING THE SEEDBED TO MAKE A FINE TILTH

Small patches of colourful annuals should be sown amongst the perennials to thicken up a new border

plants are to go, and as the hole is made with the dibber, a little of the sand will trickle down and so help to prevent the seedling from damping off. The easiest way to deal with a row of planting out is to kneel down on an old mat. Comfort when working will mean that the job is well done.

AUTUMN SOWING

More and more gardeners are taking to the idea of sowing their hardy annuals out of doors in the autumn. This is only practical, how-

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ever, in light soils, for heavy soils, as already mentioned, get wet and cold during the winter. The advantage of autumn sowing is of course that by spring the seedlings are well established, and if they have stood the frosts, are strong healthy plants ready to yield a good percentage of bloom. Also they bloom earlier than spring-sown seed.

SUMMER CARE OF ANNUALS

June should see all annuals spaced out to the correct distances in their permanent quarters. A good rough guide is to space them out as far apart as they will be across when fully grown. Although they do not now require so much care as when they were tender seedlings, yet certain things must be done if you would reap the full reward of your early labours. Watering is necessary in the evenings if the weather turns dry, but better still—use the hoe. This keeps down weeds and also aerates the soil and preserves moisture. Staking is another important piece of work. Most annuals, if they have been well grown from the beginning, will require little staking, being sturdy enough to support themselves. But slender plants such as Shirley poppies are better staked in case there is a rough wind and the whole display spoilt. A few twiggy branches pushed in amongst the stems will be sufficient to keep them upright and save damage. The taller flowers such as annual Larkspur need one or two stakes to a clump. The great thing is to stake early before the stems get twisted, and to conceal the stakes. Place the stake behind the shoot and put your twine first round the stake and then round the stem. Several spikes of smaller flowers can be tied to one stake with separate ties quite successfully. Never put just one stake in the middle of the clump and then run a string right round. The result is unnatural and ugly and the shoots have no chance to develop properly or show off their full beauty.

HARVESTING

It is not always satisfactory to grow flowers from home-saved seed, but it is very interesting. The pods should be picked when almost ripe—in the case of some flowers such as lupins, the whole spike can be picked—and these are then spread out on paper in the sun. After a time the pods will burst and the chaff can then be blown away with a pair of bellows. Put the seeds into small bags and make a special point of labelling them, otherwise next year you may find you have sown sweet peas where you wanted blue lupins.

TYPES OF FLOWERS WHICH CAN BE RAISED FROM SEED

Most amateurs are bewildered by the different types of flowers which can be raised from seed. This is because in some cases biennials are treated as half-hardy annuals and deviations from the general rule make

FLOWERS FROM SEED

the distinctions between the types rather obscure. The following, however, are the main classes and their usual method of culture.

Hardy Annuals.—These are sown out of doors in March or April, where they are to bloom. They flower the same summer and die in the autumn after flowering. A good many of the hardy annuals seed themselves quite readily, and that is why in subsequent years you will find a batch of young seedlings round the spot where last summer's flowers were. As already mentioned, gardeners sometimes sow their hardy annuals in the autumn to ensure stronger plants for blooming the next summer. This is not of course possible in very cold districts, and there is also the chance of complete failure, but if a proportion of the seed is saved for spring sowing, it is worth the gamble.

Half-hardy Annuals.—These, like the hardy annuals, flower and die in the one year, but they are not hardy enough in this country to be sown straight out of doors until late in the spring. For this reason they are sown in boxes in the greenhouse, cold frame, or just under a sheet of glass, in February or March, and then transplanted into the garden in late April or early May. Zinnias, Nemesias, Asters and Phlox Drummondii are flowers of this type, and these are flowers that may be seen on the hawkers' barrows or in nurserymen's shops in spring. Many small-garden owners who have little time or space to raise their own, buy the boxes of young plants from these sources, and if planted firmly and well watered in they are quite satisfactory. When choosing your plants, however, look for those that are a good green, not tinged yellow. Also look for sturdiness and avoid leggy plants, for these latter have been hardened off too quickly or grown under bad conditions and will never make really good plants.

Biennials.—These are plants which normally complete their life circle in two years. They are usually sown in June in a shady corner of the garden and transplanted to their permanent quarters in September. A better plan is to sow the biennials in April or May and transplant them to a nursery bed during the summer. This method gives much better, stronger plants. If the plants are wanted for early spring blooming with bulbs, as for example Wallflowers, Polyanthus and Forget-me-nots, these can be put in in the autumn at the same time as the bulbs. Biennials also seed themselves, and unless killed by sharp frosts will usually live for two or three years. To be sure of good results, however, most gardeners sow biennials afresh each year, especially if they are required for a display position in the garden. In the flower border it would not matter if the Sweet Williams were killed off. Annuals could easily be sown to fill the gap, but in a formal bed in the lawn, such a loss would be disastrous. To make bushy plants of the various biennials such as Wallflowers and Antirrhinums, the centre of the plants can be pinched

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out after they are established in their permanent beds. This makes side shoots develop and thus a uniform effect is obtained for the formal display. A little straw laid round biennials, or the use of cloches, will often save them from frost.

Perennials.—Many of the well-known flowers of the summer borders can be raised from seed, and this method is of course much cheaper than buying plants. It constitutes a very economical way of stocking a new garden. One point to remember is that varieties rarely come true from seed, but there is also the chance that you may find a new colour amongst your plants. Delphiniums, Armeria, Hollyhocks, etc., can all be sown in summer in an odd corner of the garden, in rows, for convenience, and then kept thinned out and watered until ready to transplant to the border in September. Some of these plants may take two to three years to come into bloom, but the majority will flower the year after sowing.

Alpine Plants.—The seeds of Alpines are best sown as soon as they are ripe. If this happens to be in late autumn, as it is in a few cases, defer sowing until the following spring, March is the best time. Alpine seeds are very tiny, so a specially prepared seed-bed is necessary for success. Rake a sheltered corner of the garden level and bring it to a fine tilth. If possible a layer of finely-sifted loam, leaf-mould, sand and lime in equal parts should be spread over the surface about 3 in. deep. Do not include the lime if you are sowing plants which are peat loving. Make a firm bed for the seeds by making the drills with the edge of a straight piece of wood pressed into the raked soil. The drills should not be more than $\frac{1}{4}$ in. in depth and about 6 in. apart. The merest sprinkling of soil is all that is necessary to cover the seeds, but protection from hot sun by means of cloches is beneficial. Water the seeds and keep them thinned and weeded; otherwise they can be left alone until required for planting out. An easier method of sowing is to mix fine sand with the seeds before sowing, and then a covering of soil is not required.

Shrubs and Trees.—The general rule for seed sowing applies also for shrubs and trees. The main thing is to keep the seed-bed shaded during early growth. This is because in their natural state tree and shrub seedlings are sheltered by the parent trees and very little sun or light reaches them as a general rule. The best time for most seed sowing of this kind is February. Different seeds require different treatment. Chestnut and similar fleshy seeds must be sown as soon as they fall or else kept moist until sown. Holly can be raised from its berries by mixing sand with them and leaving the heap exposed to the weather for a year. This treatment gradually rots away the outer covering so that the seeds are released. Sow the seeds and sand together in drills and keep covered with a cloche until the seedlings are a few inches high.

FLOWERS FROM SEED

USE OF FLOWERS FROM SEED

The annuals and biennials which we can have in our gardens at so little cost can be used in many ways to add to its beauty. A good many people think of annuals as leggy, untidy occupants of the garden and not worth the trouble involved. Think for a moment, however, of the variety of uses to which they can be put. There are bedding plants, climbers, edging, rock garden plants, greenhouse and room flowers, plants for screening and plants for the mixed flower border

Bedding Plants.—Let us take bedding plants first. Hardy and half-hardy annuals and biennials can be used for this purpose and, if the colours are selected with care, very charming effects can be obtained. A careful study of the seedsman's catalogue will give you many suggestions, only be careful to note the heights and habits of growth so that you get a balanced effect. Orange Marigolds look very well with Blue Annual Larkspurs and an edging of *Ageratum*, mixed with Candytuft or White Alyssum, to give but one example.

Climbers.—Some of the finest climbers are to be found amongst the annuals, and they are a decided boon to the owner of a new garden, for they will cover his fences the first season with bloom while the more permanent climbers are coming along more slowly. Amongst these flowering climbers are *Cobaea scandens*, Morning Glory, *Nasturtiums* and Hops. Tall annuals such as Sunflowers can also be used to screen out an unfinished part of the garden for a year.

As Edgings.—Hundreds of annuals can be obtained in dwarf form suitable for edging plants. There are vivid red and orange Tom Thumb *Nasturtium*, dwarf *Godetias*, which look just like small bushes of *Azaleas*, dwarf *Heliotrope* and others, better known, such as *Ageratum* and Alyssum. These can also be used for carpeting. Rose beds look much less bare if carpeted with a tiny annual chosen to harmonize or contrast in colour with the main variety in the bed. An edging of Scarlet Flax or *Eschscholtzia* adds a great deal to the charm of the path through the vegetable or fruit garden.

In the Rock Gardens.—Annuals can be scattered on a new rock garden to make a quick show: and for long after the alpine have been put into place you will have interesting odd flowers coming through each year. The Swan River Daisy, *Brachycome*, is an interesting flower for such a place. If the path through the rock garden is of odd or crazy paving, a few seeds of annuals scattered amongst them will make a flower-decked path very quickly. Other paths in the garden can be treated in the same way, but, if they are in constant use, see that the seeds, as far as possible, are kept to the sides, otherwise walking will be impeded.

In Town Gardens.—Even if your garden is of the tiniest and consists of pots and boxes, you will find these flowers from seed invaluable.

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For one thing they can be sown freshly each year and are not asked to try and stand through the trying conditions of town winter weather. Annuals sown two or three in a pot for house decoration are very beautiful, and a greenhouse can be kept in beauty throughout the year by their aid.

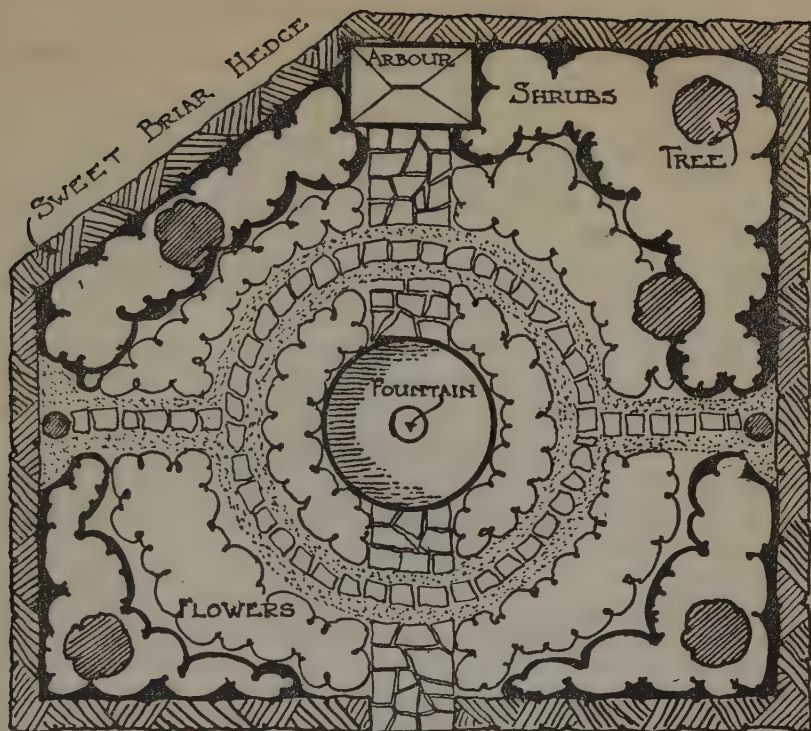
In the Mixed Flower Border.—Where casualties occur in the flower border, owing to the hunger of the slug or similar reason, a patch of annuals will save its bareness through the summer. Colours can be chosen to harmonize with the general scheme and the border be none the worse for its loss.

For Fragrance.—Annuals can also be used to bring fragrance to your garden. The Night-scented Stock sown under your house windows is almost invisible during the daytime, but after sunset its pinky-mauve petals will open and the air be filled with perfume. The Tobacco plant, now obtainable in pink as well as white shades, is another flower which gives its fragrance when the dews are settling, together with the yellow Evening Primroses. Such flowers should not be given an important place in the garden but, scattered amongst showier plants near a favourite seat, they will delight you in the cool of the evening. Flowers which are showy as well as scented are the Stocks and Wallflowers, the Sweet Peas and the old-fashioned Mignonette, which can now be obtained in giant spikes, much more showy and just as fragrant as the older varieties.

Decorative Foliage.—Many of the most useful foliage plants come easily from seed, and some of these should be included in the seed order so that they can be used as a foil for bright flowers in the garden and also in the vases. Think of the myriad types of grasses to be seen in one field and you will realize what a vast number there must be at the disposal of the gardener. These seeds should be sown very lightly, and just a mere beating down of the soil with the back of the spade is sufficient to cover them.

Besides grasses there are others with colourful foliage. There is Burning Bush or Kochia which, when well grown, makes fine specimens in the formal garden. The leaves are vivid green in summer so that the plants look like small conifers, but in autumn they turn a flaming red. It is one of the half-hardy annuals, so cannot be sown directly into the open ground where it is to grow. The ordinary vegetable Beet also gives fine foliage effects and is often seen in formal bedding schemes used as an edging.

For Exhibition.—So important have annuals become that many classes are given to them at Flower Shows. Amongst those most used for show purposes are Asters, Salpiglossis, Marigolds, Antirrhinums, Scabious and Sweet Peas.



A scented garden in which only fragrant flowers are used, from tufts of creeping Thyme in the paving, to the Sweet Briar hedge

BORDER PLANTS

Lupins, Heleniums, Polyanthus, Pinks, Wallflowers, Lilies, Sweet Williams, Pæonies, Mignonette, Verbena, Irises, Lilies-of-the-Valley, Tobacco plants, Night-scented Stock, Evening Primrose, Carnations, Violets, Cheiranthus, Salvias, Verbascum, Dictamnus and nearly all the herbs. Thymus in variety and Mentha Requieni can be used to form a carpet between the stepping-stones in place of grass.

SHRUBS

Lavender
Santolina
Rosemary
Lilac

Rosa damascena
Rosa centifolia
Ribes aureum
Daphne
Honeysuckle

Brooms
Buddleia
Chimonanthus fragrans
Hamamelis mollis
Jasmine

TREES

Cratægus (Hawthorn)

Lime

Standard Lilac

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There are one or two points which are all important when raising flowers from seed. Here they are.

Always label all seed directly it is sown. It is hopeless trying to get pleasing colour schemes when you have no idea which colour Asters you put in this box and which in that; and boxes have a strange way of getting moved accidentally, and muddled, however careful you are.

Use the hoe throughout the season. It is much better than the watering-can. Do not be afraid to sow in bold groups. Small scattered specimens do not repay in general effect the work put in to produce them.

Cut away blooms as soon as they fade. This will give you a second crop of flowers. To obtain a succession of blooms, sow two or three times a year at intervals of a week or so.

TROUBLES AND THEIR CURE

With healthy cultivation annuals should give little trouble. There are, however, one or two things which may attack them and with which the gardener should be able to deal.

Damping-Off is the most dreaded disease. This is caused by a fungus, and once a patch, or box, is affected the whole crop is wasted. It gains a hold over the plants because of bad ventilation, insufficient light, and overcrowding combined with too much moisture. From these facts it will be seen that prevention is better than cure. The only thing to do with affected plants is to burn them and dress any remaining seedlings with flowers of sulphur. Sterilization of the soil by watering with four ounces of formaldehyde to a gallon of water before sowing is helpful; also the use of sand in the soil and mixed with seed when sowing.

Mice and Birds are both very fond of seeds. The best way to frustrate them is to soak the seeds overnight in water, and after they have been spread out on paper to dry a little, sprinkle a few drops of paraffin over them. If red lead is then dusted over and the seeds well shaken up so that they are well covered, mice will leave them severely alone. A few break-back traps set amongst the rows of seeds are also a preventive. Grass seed well dusted with disinfectant powder before sowing will not attract birds, and black cotton stretched backwards and forwards from sticks across the seed-bed will also scare them. The birds catch their wings in the cotton, which they cannot see very well, and are frightened away.

Slugs love tender young seedlings, but they can be cured of their tastes by watering the soil on each side of the seed rows or round the patches with a solution of aluminium sulphate. A sprinkling of this, powdered, is also effective.

FLOWERS FROM SEED

SELECTING VARIETIES

The best way to choose actual varieties for your own garden is to study a seedsman's catalogue. This is because new varieties are introduced each year, and at very little extra cost you can be thoroughly up-to-date, and have the best. If possible, devote a corner each year to trying new annuals. Do not use them for your main display till you know their ways.

ALPHABETICAL LIST OF THE COMMONER FLOWERS THAT CAN BE RAISED FROM SEED

ACROCLINIUM (hardy annual).—This belongs to the group of everlasting flowers, which can either be grown in pots or used in the borders in the summer. They are amongst the first annuals to bloom, usually flowering about six to seven weeks after being sown. There are single and double varieties in rose and white.

ADONIS AESTIVALIS (hardy annual).—The blooms are a very deep crimson, and the foliage has a feathery appearance—grows 1 ft.

AGERATUM (half-hardy annual).—There are two types, one of which grows to about 1-2 ft. high, and the other about 9 in. high. Of the latter "The Little Blue Star" is one of the best for formal beds and edgings, as the plant is literally covered with blossom of a very bright hue, and is not more than some 3 in. high.

AGROSTEMMA, Coeli Rose (Rose of Heaven) (hardy annual).—This has bright-rose flowers with white centres and grows to a height of 18 in.

ALYSSUM.—Sweet-smelling hardy annuals with white or lilac-coloured bloom all the summer. These plants are most suitable for edgings or rock gardens, and prefer a sandy soil with sunny aspect. They usually perish in heavy rich clay soil in winter. They are close-growing plants and never attain a height of more than 9 in.

AMARANTHUS (half-hardy annual).—Beautiful ornamental foliage and rich scarlet-crimson flowers. They vary in height from 18 in. to 3 ft.

ANAGALLIS (hardy annual).—*A. grandiflorus* is a charming little plant about 4 in. high. Its little blue flowers are produced in great numbers from May to September. *Alinifolia cœrulea* has flowers that are a gentian blue, very large, and the plant itself grows to a height of 12 in.

ANTHEMIS.—The commoner *Anthemis* are perennials, but there is one delightful annual form—*Anthemis Arabica*. Its flowers are yellow, rather like a daisy and set in dainty foliage similar to *Love-in-a-Mist*. It grows to a height of 1 ft. It is one of the loveliest hardy annuals and is easily produced from seed.

ANTIRRHINUMS (Treated as annual, biennial or perennial).—Whether raised from seed by the gardener or purchased from the nurseryman,

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these are one of the best stand-bys for summer display. There are so many good varieties that the best plan is to consult a seedsman's catalogue and choose those which fit in with your particular colour scheme. There are three main types—intermediate 15 in.; Tom Thumb, 6 in.; and tall, 3 ft.

ARCTORIS, A. Grandis.—Is a valuable half-hardy annual growing to a height of 2 ft. Its daisy-like flowers with mauve and golden centres are produced on white downy stems. It should be grown in a dry spot in the border. Sow the seed under glass in March and plant out into the border in May. This is an annual which everyone should grow.

ARGEMONE, A. grandiflora.—Sometimes called the Mexican Prickly Poppy or Devil's Fig, is a native of Mexico. In that country it is a perennial, but in England it is best treated as an annual, and it loves the sunshine. The seed should be sown in the border from March to April. It does not need to be transplanted. Another variety is *Argemone Mexicana*, which bears yellow flowers very similar in shape to those of *grandiflora*.

ARTEMISIA.—Is a hardy annual which grows to a height of 4-5 ft. Its foliage is very beautiful and the plant grows in the form of a pyramid, so that it is sometimes known as the Summer Fir. It is useful for growing as single specimens in pots or in the border. It loves the sun and requires a well-drained but not very rich soil.

ASPERULA (*Azurea setosa*).—These belong to the hardy annual family and give white, blue and red blooms in summer; bloom is very lasting. They are very fond of the rockery but will grow quite well under trees, providing the soil is light and rich. They are related to the Coffee plant, and when growing form a mass carpeting of sweet-scented flowers. *Azurea setosa* is a native of California and grows to a height of 1 ft.

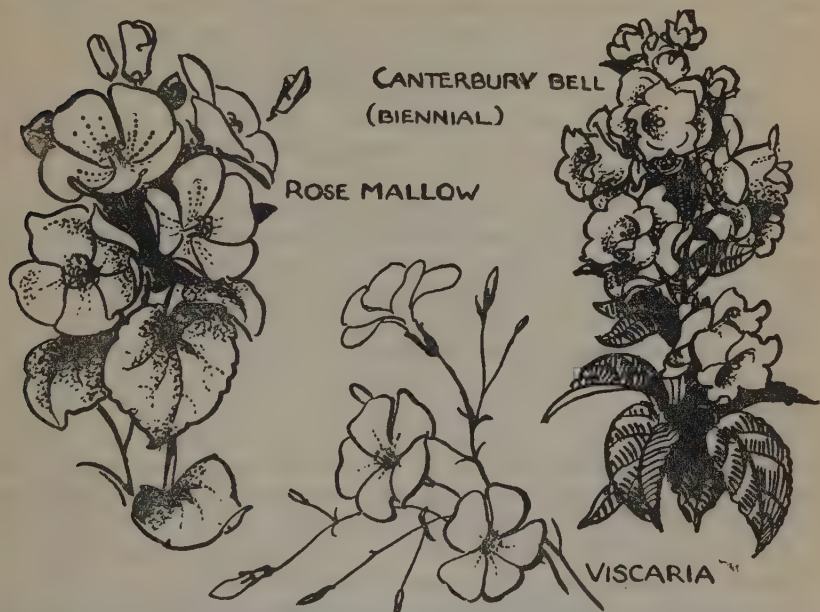
ASTERS (half-hardy annual).—There are several types which are very bewildering to the amateur. The generic name is *Callistephus*. There are modern strains such as Ostrich Plume (these have very feathery heads and grow 18 in. high); Comet (which resembles the Japanese Chrysanthemums and grows 18 in. high); Chrysanthemum Flowered (1 ft. high); Pæony-flowered (2 ft); Victoria (18 in.) and Single (18 in.). A huge assortment of colour is available in all these strains.

ATRIPLEX, *hortensis rubra*.—Makes a charming decoration as it bears red foliage, grows to 4-6 ft., is a perfectly hardy annual and will do well almost anywhere. Is a good feature in a mixed border. *Atriplex chenopodiaceæ* is a semi-evergreen shrub and bears a bluish-green or silvery foliage. This plant is particularly suitable for the seaside, and produces small, though unattractive, flowers. It loves the sun and thrives best in a dry soil of a light nature.

FLOWERS FROM SEED

BALSAM (half-hardy annual).—An old-fashioned, flower of which the seedsmen now offer many improved varieties. It likes a sunny position in rich soil for its camellia-like flowers to be seen at their best. The colours range though white, pink and mauve shades.

BARTONIA (hardy annual).—*B. aurea* is a showy plant with large bright-yellow flowers from June to October. It grows to a height of 18 in. and is a useful flower to sow in the mixed flower border.



Annuals are usually sown in early spring for summer flowering, while biennials are sown in mid-summer to give flowers the following year

CACALIA (hardy annual).—The Tassel Flower. Bears vivid orange, daisy-like flowers in late summer and early autumn. It grows 18 in. high and is very useful for indoor decoration.

CALANDRINIA (hardy annual).—*C. grandiflora* grows 18 in. high and has bright, rose-coloured flowers in June till September. *C. speciosa* is a dwarf variety suitable for the rock garden. It has ruby-coloured flowers and grows 9 in. high. These flowers like an open, sunny position.

CALENDULA (hardy annual).—These well-known annuals are extremely easy to grow, and for that reason are sometimes despised. There are, however, many new varieties such as *Chrysantha*, *Art Shades* and others. The brilliant orange double varieties, such as *Radio* and *Orange King*, will brighten a dull corner of the garden right through the summer

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months until the frosts come. There are also yellow double and single varieties, all about 18 in.

CALLIOPSIS. See COREOPSIS.

CAMPANULA.—Most of the campanulas are perennials, though they can be raised from seed, but there are one or two annual varieties which are useful for garden display. *C. attica* grows but 6 in. high and has violet-coloured flowers all through the summer. *C. Loreyi* has blue flowers about one foot high rising above pretty tufts of foliage. Both these annuals are fine for edgings or odd corners of the rock garden.

CANARY CREEPER. See *Tropæolum canariense*.

CANDYTUFT.—The old-fashioned, inconspicuous candytuft has now been replaced by selected pink, lilac, white and other pastel shades. Well-grown plants of this dwarf, compact hardy annual make fine pot plants.

CANTERBURY BELLS.—Campanula medium are true biennials. There are double, single and cup-and-saucer varieties in blue, violet, white and pink. They grow to a height of 3 ft. and are very showy flowers for the mixed border or edge of the shrubbery, where they bloom right through the summer if care is taken to remove flowers as they fade.

CARNATIONS.—The annual varieties will bloom in August if sown in January and February. At the end of the summer they can be potted up and will then bloom on indoors through the winter. The *Marguerite* type can now be had in separate colours in double form, and all are sweetly scented. There are white, yellow, pink, crimson and scarlet varieties. The *perpetual early-flowering* varieties can be obtained in mixed colours and will flower six months after sowing.

CASTOR OIL PLANT (half-hardy annual).—These plants, properly known as *Ricinus*, are usually grown for greenhouse display, but are equally useful in the garden. They grow from 3-4 ft. and their chief attraction is their handsome foliage. They should be brought indoors in September.

CELOSIA PLUMOSA (half-hardy annual).—Better known perhaps as Prince of Wales' Feathers. They flower in midsummer and grow to about 15-18 in. The bright, orange and scarlet varieties are used chiefly for formal bedding schemes. *C. cristata* is the variety usually called Cockscomb.

CELSIA CRETICA (biennial).—A tall border plant, about 5 ft., which bears bright-yellow flowers all through the summer. Very useful as a stop gap in the flower border.

CENTRANTHUS MACROSIPHON (hardy annual).—This grows 1 ft. high and has large heads of bright-red flowers in summer.

CHRYSANTHEMUM (hardy annual).—There is a wide choice of annual chrysanthemums to choose from, both single and double forms. They

FLOWERS FROM SEED

are compact growing and form fine border, edging or bedding plants. They have white, golden and bronzy yellow petals with deep brown centres. Named varieties are Eastern Star (primrose yellow with chocolate centre); Morning Star (soft yellow); Evening Star (deep yellow) and Northern Star (ivory white with a pale yellow disc round the centre).

CINERARIAS.—These showy greenhouse flowers can be raised easily from seed. They should be sown in April, May or June, for flowering in March or April of the next year. By careful cultivation they may be had in bloom from November to March. There are three main types—stellata, intermediate and large flowered. Seeds can be obtained either in mixed colours or in pink, scarlet, blue, purple or white. *Cineraria maritima* is a variety used for summer bedding and has very effective silvery-grey foliage. It grows about 18 in. high.

CLARKIA (hardy annual).—These flowers have been greatly improved recently and there are named varieties such as Firefly (bright crimson), Salmon Queen, Scarlet Beauty and Snowball. Seedsmen yearly make fresh introductions, and some of these are well worth trying. All grow to a height of 2 ft. and flower from July to October. By sowing seed in August, bloom may be had for the greenhouse in the winter months.

CLINTONIA PULCHELLA (half-hardy annual).—This is a tiny dwarf edging plant growing but 4 in. high. It has bright blue flowers rather like the lobelia, with a white eye.

COBÆA SCANDENS (half-hardy perennial).—This purple-flowering climber can be used quite successfully as an annual climber on a warm wall. As a greenhouse climber it makes an interesting evergreen subject and is also sometimes hardy in the south and west of England.

COLLINSIA (hardy annual).—These are dwarf plants which thrive under town conditions. They are very effective as edgings, being lilac and white in colour and growing about 9 in. high. Some seedsmen now list a salmon-pink variety, also dwarf. They flower from July to October.

COLLOMIA COCCINEA (hardy annual).—This is compact in habit, growing 9 in. high. The orange-red, star-like flowers are produced all summer.

CONVOLVULUS.—*C. major* or Morning Glory can be obtained in separate colours of blue, crimson, purple, scarlet and rose. It is ideal for covering trellis, pergolas and summer-houses. The other climbing convolvulus are known as *Ipomœas*. There is a scarlet variety, *coccinea*, and a red variety, *rubro-coerulea*. Although these are strictly perennials, they are quite satisfactory grown as half-hardy annuals, and like a sunny position. There are one or two dwarf-growing convolvulus about 1 ft. high in dark and light blue, pink and white.

COREOPSIS (hardy annual).—There are one or two half-hardy varieties

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and a huge selection of hardy ones. These very showy flowers, with colours ranging through lemon, yellow, brown and, deep red can be used for summer displays in the town garden as well as more favoured sites. *C. tinctoria* grows 3 ft. high, *C. coronata* 18 in., and there are also varieties about 9 in. Thus it will be seen that some can be chosen for edgings, for formal bedding and for the mixed-flower border. Their flowering seasons cover June to September and October in mild districts.

CORNFLOWER (hardy annual).—The tall, blue cornflowers are well known for their long-flowering period and hardiness. The soft pink-coloured varieties are not so common, but they make charming border flowers, rising to a height of 3 ft. Mixed varieties give many pastel and deeper shades which are very effective. The dwarf varieties, about 9 in. high, make vivid blue, compact edgings and are quite suited for pot culture.

COSMEA (half-hardy annual).—Best results are obtained from sowing an early-flowering variety, and then cut bloom can be had for the house throughout the summer. The flowers, in shades of pink, white, crimson and yellow, are borne on long graceful stems, and with their finely-cut foliage make very decorative flowers for the house vases. They grow about 2 ft. high and there are some double varieties which are not, as yet, however, quite "fixed."

COTULA.—There is one interesting annual variety of this plant, *C. barbata*, which has been introduced quite recently. It grows 3 in. high and so is very suitable for edgings or the rock garden. It has masses of small, yellow, button-like flowers.

CYNOGLOSSUM.—There are annual, perennial and biennial varieties. All come easily from seeds and bear blue, Forget-me-not-like flowers from June to August. They grow about 18 in. high.

CUPHEA (half-hardy annual).—*C. miniata* is the half-hardy annual variety and is very useful as a bedding plant. It grows 1 ft. high and has masses of bright scarlet flowers and bright green foliage.

CYCLAMEN.—These popular flowers come quite well from seed and amply repay the care given to them. They will make a fine display in the greenhouse at Christmas time and are very useful for house decoration. They are best raised annually from seed sown in August or a little later, pricked out and finally potted up singly in July ready for flowering in December. There are many new colours, including crimson and salmon, also some specially sweetly-scented varieties. Seedsmen list many named varieties.

DATURA.—*D. cornucopia* has double, white flowers, sweetly scented and veined purple. It grows 18 in. high and can be treated as a hardy annual. *D. chlorantha flora pleno* is also a sweetly-scented variety. It grows 2 ft. high and has yellow trumpet-shaped flowers in May and June.

FLOWERS FROM SEED

DIANTHUS (half-hardy biennial).—These can be sown under glass in January and February to bloom the same year, or if sown in June will bloom the following season. There are single and double varieties in all shades of red and pink with shaded markings. *D. chinensis*, the Indian pink, is a hardy biennial. Most varieties grow from 9 to 12 in. and bloom throughout the summer.

DIASCIA BARBARAE (half-hardy annual).—A useful flower for edgings and pot plant. It grows 9 in. high and produces pink flowers on slender stems throughout the summer.

DIDISCUS COERULEUS.—Sometimes called the Blue Lace flower, this annual is not quite hardy and likes a sheltered spot in the garden, or is very effective grown under glass. It grows 18 in. high and its dainty heads of blue flowers are very decorative.

DIGITALIS (hardy biennial).—This is much better known under its homely name of foxglove. It loves a shaded, moist part of the garden, where it will grow 4 ft. or more and flower well through mid and late summer from seed sown out of doors in June. There are varieties in shades of yellow, apricot, white, rose and the "Shirley" strain, which includes spotted and chocolate-coloured varieties.

DIMORPHOTHECA (hardy annual).—This is one of the annuals which has come to us from South Africa. It likes a sunny position and will then produce flowers right through the summer until cut down by the frosts. *D. aurantiaca* has bright orange flowers and grows 12 ins. The *aurantiaca* hybrids include salmon, apricot and yellow shades. They are fine plants for bedding, the rockery or greenhouse decoration.

ECCREMOCARPUS.—This is a half-hardy climber with orange-scarlet flowers. It is very useful for covering trellis work in a warm position and quite effective in the greenhouse. *E. scaber* is the orange variety and there is also *roseus* with red flowers, and *longiflorus*—yellow. They bloom through July to September.

ECHIUM (hardy annual).—*E. plantagineum* has purple-blue flowers in summer and grows 2 ft. high. *E. creticum* is slightly dwarfer and has soft red flowers.

ERYSIMUM (hardy biennial).—Sometimes known as Cheiranthus linifolium or the Alpine Wallflower, *E. linifolium* is a charming early flower for the spring rock gardens or beds. Its mauve flowers form on 9 in. high plants and are seen in May.

ESCHSCHOLTZIA.—These are usually treated as hardy annuals, and make a fine display in the summer beds. There are many new shades besides the usual orange and lemon. These include golden-bronze, pink, red and buff. Their dainty buds, leaves and stems make them very useful as cut flowers, especially as the buds will open in water. They all grow to about

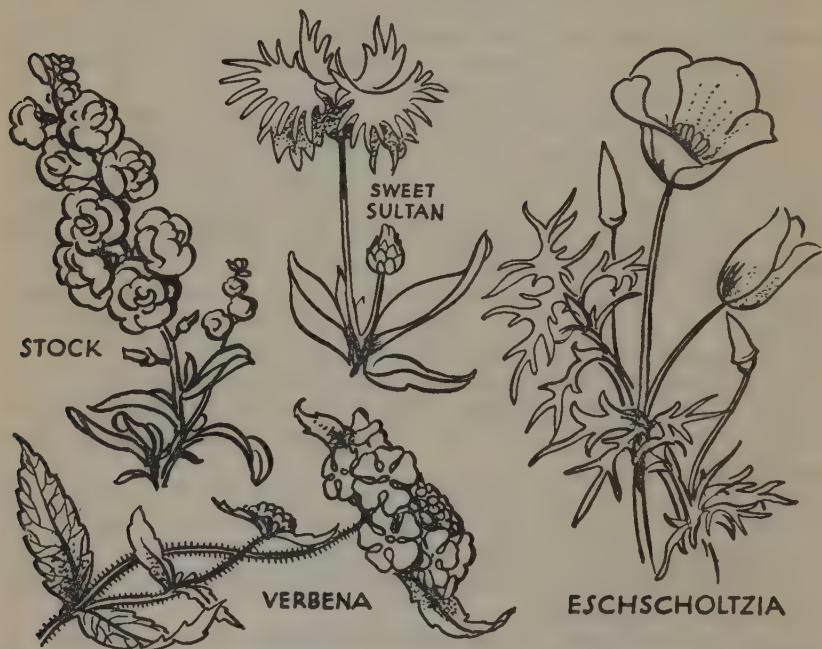
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1 ft. high and flower from May to September. They like a sunny place and thrive in poor, light soil.

EUPHORBIA.—This annual has soft green leaves variegated with pure white and grows 18 in. high. *E. marginata* is the annual variety.

EUTOCA VISCIDA (hardy annual).—These blue flowers are loved by bees. They grow 1 ft. high.

EXACUM AFFINE (biennial).—A beautiful pot plant for greenhouse decoration, which grows 9 in. high. Its bright mauve flowers, which are produced within six months of sowing, are sweetly scented.



In your seed order remember to include some flowers which give fragrance, and others which will provide cut blooms

FELICIA BERGERIANA (half-hardy annual).—A dwarf plant, 6 in. high which has brilliant blue flowers with a bright yellow disc.

FLAX. See **LINUM**.

FORGET-ME-NOT. See **MYOSOTIS**.

GAILLARDIA.—These are really perennials, but are very satisfactory treated as half-hardy annuals. Their bold crimson and yellow colours make a fine show in the garden and are very effective in the vases. There are many named varieties, all flowering from June to October and reaching a height of 30 in.

FLOWERS FROM SEED

GERBERA.—These dainty flowers, which are very useful for indoor decoration, may be had in all shades of cream, yellow, orange, pink, red, purple and violet. The numerous, long-pointed petals have a pale yellow centre, and the flowers continue blooming for a long period.

GILIA.—*G. coronopifolia* is a half-hardy biennial but is best grown as a half-hardy annual. It has spikes of bright red, pink or yellow flowers, 3 ft. long and larkspur-like foliage. The annual Gilias grow about 18 in. high from June to October and are white, lavender or yellow in colour.

GLOBE AMARANTH (half-hardy annual).—This is grown chiefly for its use as an everlasting flower. The most common variety is purple, and is seen a great deal in winter bouquets.

GLOXINIAS.—Are tender perennials but can be had in bloom six months after sowing if care is taken. Successional sowings will give blooms practically all the year under glass. The colourings are scarlet, white, purple, blue and pink. The foliage is very ornamental.

GODETIA (hardy annual).—Very beautiful flowers for use in the summer borders or in pots under glass. The dwarf varieties resemble small *azaleas*, and the beautiful new colourings which have been introduced lately, make them indispensable in the garden as edgings and for formal beds. The taller varieties grow from 2 to 3 ft. high and the dwarf ones 9 in. to a foot. The colours cover pink of all shades, red, white and mauve. There are double and single varieties.

GRASSES.—Many of these are worth growing in the flower border for their lightening effect, and are of course very useful for arranging with cut flowers. Some of the best annual grasses are *Agrostis laxiflora*, *Avena sterilis* (Wild Oats), *Briza maxima* (Quaking Grass), *Eragrostis elegans*, *Festuca stipoides*, *Lagurus ovatus*.

GYPSOPHILA.—There are perennial and annual varieties of this useful flower. *G. elegans* has feathery white flowers and grows 18 in. An improved form of this variety, *G. elegans*, has much larger flowers and is therefore more suited to garden decoration than the house vases. *G. muralis* grows only 9 in. high and is very charming on the rock garden.

HAWKWEED (hardy annual).—The yellow Hawkweed of the meadows is well known, but the cultivated pink variety is well worth growing for decorative effect in the garden. It has semi-double flowers in summer and grows 18 in. high.

HEBENSTREITIA COMOSA.—This is one of the delightful flowers which gives of its sweetest perfume after sunset. Its small white flowers are arranged in spikes like the Mignonette, but they are blotched with orange. It may be treated as a half-hardy annual or sown out of doors in April.

HELIANTHUS. See SUNFLOWER.

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HELICHRYSUM (hardy annual).—These everlasting flowers are charming in the garden and also greatly prized for their use in bouquets in the winter. There are pink, red, cream, white, yellow and silvery-white varieties all growing about 3 ft. and there is also a dwarf strain rather more compact growing to 2 ft.

HELIOPHILA.—Another of the South African annuals. It has soft blue flowers with a white eye, grows 18 in. high and is very useful for greenhouse decoration, or if treated as a half-hardy annual, is quite pleasing in the garden.

HIBISCUS.—The annual variety *H. africanus major* has soft yellow flowers with violet-coloured centres. It grows 2 ft. high and flowers from June to October.

HONESTY (hardy biennial).—The silvery seed-pods of this plant are quite well known, but the spring bright red and purple flowers are also worth consideration. This plant will grow in shady places such as under trees and reaches a height of about 2 ft. Its generic name is *Lunaria*.

HUMULUS (annual).—The annual hops are very valuable rapid-growing climbers. *H. japonica* is the green variety, but there is also one with variegated leaves. Both can be used to cover pergolas and trellis, and make a show the first year in a new garden.

ICE PLANT. *Mesembryanthemum* (half-hardy annual).—This is a useful plant for the rock garden or miniature garden. It has fleshy, white leaves and pink flowers, daisy-like, opening one after the other.

IONOPSIDIUM ACAULE (hardy annual).—Very useful for scattering amongst paving stones to give a quiet softening effect. Grows only 2 in. high and has pale mauve flowers.

IPOMÆA. See **CONVOLVULUS**.

JACOBÆA (hardy annual).—There are single and double types of this old garden flower, and it is used a great deal for bouquets. There are crimson, rose, mauve, purple and white varieties all growing about 18 in. high and flowering all the summer.

KAULFUSSIA AMELLOIDES (hardy annual).—A dwarf blue or crimson flower suitable for edgings or rock garden.

KOCHIA TRICHOPHYLLA (annual).—A quick-growing plant which makes a shapely bush 2 ft. high of finely divided leaves. It looks rather like a young Cupressus, but in the autumn its leaves turn a vivid red. It makes ideal specimen plants for the rock garden or formal garden.

LARKSPUR (annual).—These are annual Delphiniums. The tall varieties, either single or stock-flowered, are ideal for filling gaps at the back of the mixed flower border, while the dwarf varieties make fine bedding plants. They can be had in all the Delphinium shades, blue, mauve, white and pink, and also bright scarlet. Sown in March or

FLOWERS FROM SEED

April where they are to bloom and thinned out very definitely, they will form sturdy plants and flower well the same year.

LAVATERA (hardy annual).—These Mallows are very showy plants for the flower border. *L. rosea splendens* is perhaps the best known. It has bright rose-pink flowers all the summer which are ideal for cutting, and grows 3 ft. high.

LEPTOSIPHON (hardy annual).—All varieties are dwarf and suitable for edgings of the rock garden. They are free flowering, grow 3 to 6 in. high and are in lilac, white, red or bright yellow colourings.

LEPTOSYNE.—*L. Stillmani* is a hardy annual growing 18 in. high and producing masses of bright yellow flowers five weeks after sowing out of doors. *L. maritima* is a half-hardy variety growing 3 ft. high. It also has yellow flowers.

LAYIA ELEGANS (hardy annual).—This comes from California, grows 1 ft. high and has yellow flowers edged with white.

LIMNANTHES DOUGLASII.—Another hardy annual which attracts bees because of the sweet fragrance. Its yellow and white flowers are borne on plants 6 in. high. It flowers right through the summer.

LINARIA.—Annuals resembling *Antirrhinums*, in miniature. They grow only 9 to 12 in. high but make very decorative plants either in the border or arranged in vases. There are white, golden, purple and pink colourings. All flower from June to September and do not greatly dislike town gardens.

LINUM.—There is an annual blue and an annual red variety. Both open their flowers to the sun and shut them at night. They carry on blooming right through the summer, and growing only 12 in. high, are good for formal beds, although they sometimes become a little straggly towards the end of the season.

LOBELIA.—These half-hardy annuals have for years been the gardener's stand-by for edgings in formal bedding schemes. There are others now getting better known which can quite well take their place, but some of the newer, brighter-coloured lobelias are hard to beat for really formal effects. There are now dark and light blue, mauve, purple, crimson, and white varieties. There are also some tall varieties which grow to 12 in., and spreading varieties which are used a great deal for greenhouse hanging baskets.

LOVE-IN-A-MIST. See **NIGELLA**.

LOVE-LIES-BLEEDING (hardy annual).—Grows 3 ft. high and has long drooping bright red flowers in summer. The plants grow to about 3 ft. and are very decorative in the mixed border.

LUPINS.—The annual varieties are quite as beautiful as the perennials, and well worth including in your seed order. The heights vary from 1 to 3 ft. and all the perennials' colours can be seen in the

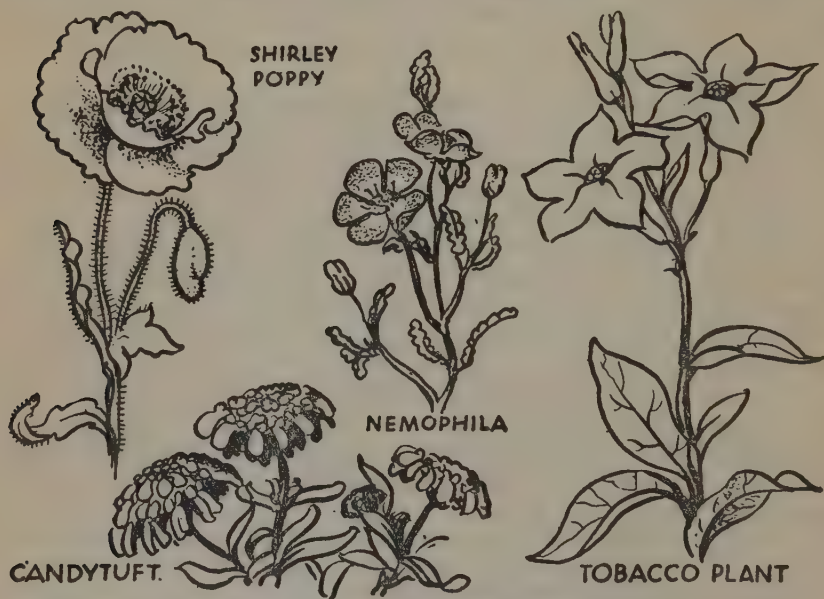
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annuals. They are best sown where they are to flower and thinned out to 18 in. to allow for full development.

MAIZE (half-hardy annual).—Grown for its handsome, variegated foliage. Is useful in the shrubbery or for greenhouse decoration.

MALOPE (hardy annual).—This has flowers like the *Lavatera*, in red and white varieties. It grows 2 ft. high.

MARIGOLDS.—Double and single African, also double and single French types all belong to the genus "*Tagetes*." (The ordinary pot Marigolds will be found under the name *Calendula*.) The African



Many flowers come so easily from seed that no garden should be without colour in the summer months

Marigolds in all tones of orange and yellow have tightly-frilled balls of flowers on plants 2-2½ ft. high. The French type, which include the *Legion of Honour* variety, are yellow, orange or red in colour and the petals are more separated. They grow from 9 in. to 2 ft.

MARTYNIA FRAGRANS (half-hardy annual).—A scented 2 ft. high plant with mauve flowers and woolly foliage.

MIGNONETTE (hardy annual).—These can be sown at intervals to give a succession of scented bloom for garden and house. The modern varieties with their huge spikes of white, red, and yellow flowers are worth growing for their beauty as well as their fragrance. Mostly they are

FLOWERS FROM SEED

18 in. high but there are one or two dwarf varieties suitable for pot culture.

MYOSOTIS (biennial).—Best sown in May for early spring blooming. They need not all be planted out to make a carpeting for the spring bulbs. If a few are potted up they make fine flowers for indoor decoration during the early months of the year. All grow about 6 in. high and are varying shades of blue. Soil conditions sometimes turn them slightly pink.

NASTURTIUMS.—These flowers flourish almost anywhere. In fact, they are better on a poor soil than a rich one, for the nourishment makes them run to leaf rather than flower. There are dwarf, or Tom Thumb, varieties and the tall, climbing varieties. Colours range from yellow, orange, red to crimson, and those with variegated foliage are very ornamental. One of the latest varieties, *Golden Gleam*, is sweetly scented, double and, under suitable conditions, simply smothers itself with bright yellow flowers all the summer.

NEMOPHILA (hardy annual).—These will grow almost anywhere, have white, purple or blue flowers and grow about 6 in. high. They flower from June to September.

NEMESIA (half-hardy annual).—Can be had for early summer or mid-season flowering or spring greenhouse decoration by varying the sowings. Every shade of colour seems to be present in a mixed bed of these dainty flowers, but they can also be bought in separate colours for definite colour schemes. All are about 12–18 in. in height.

NICOTIANA (half-hardy annual).—The Tobacco plant is one of the scented plants particularly sweet after dew has settled. The usual variety is white, but there are also crimson and red ones, all of which will grow in the shade and do not mind town conditions. They grow about 3 ft. high.

NIGELLA (hardy annual).—Dainty blue and white flowers, 18 in. high with extremely dainty foliage. They are invaluable for their long flowering season and very effective in the mixed flower border.

NIGHT SCENTED STOCK. See **MATHIOLA**.

NOLANA GRANDIFLORA (hardy annual).—Likes a sunny position and spreads very rapidly. It is only 9 in. high and has lavender-blue flowers, rather like the *Convolvulus*, with a white throat. It will quickly cover a bare place in the rock garden or border.

NYCTERINIA (half-hardy annual).—Another of the evening-scented flowers. This one is blue and white, dwarf, and suitable for the rock garden.

OENOTHERA or Evening Primrose is another of the evening-scented flowers. There is a biennial variety, *O. trichocalyx*, which grows 18 in. high and remains open all day. *O. acaulis* is a biennial, white tinted rose, and *O. biennis grandiflora* a tall-growing yellow biennial. *O. taraxaci-*

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folia is a dwarf, hardy annual variety which is useful for edgings or the rock garden, flowering from June to October.

OXALIS.—There are one or two hardy annual varieties, although most of these charming little flowers are perennials. *O. corniculata* is yellow and grows 4 in. high. The bright green leaves are almost hidden from August to October by the masses of flowers.

PANSIES.—These are usually grown as biennials and are invaluable for edging and carpeting. Practically all shades can now be obtained to suit individual colour schemes. *Ullswater* (blue), *Lord Beaconsfield* (purple violet) and *Black Prince* are outstanding named varieties.

PAPAVER. See POPPY.

PERILLA (half-hardy annual).—This is rather slow in germination, but the fine foliage makes useful table decorations and is pleasing in the flower border. *P. nankinensis* has rich bronze foliage and grows 2 ft. high. *P. atropurpurea laciniata* is much the same but has faintly divided leaves.

PETUNIAS (half-hardy annuals).—These well-known flowers like a sunny position, and there are three main types listed by seedsmen, double, single and dwarf. They can be used for individual beds, patches in the mixed-flower border or as edgings. The colours range from white, pink, red, crimson, blue to violet. All flower from June to October, the tall double and singles being 18 in. high and the dwarf ones 5–8 in. They are very effective, used in tubs and boxes on the roof garden.

PHACELIA (hardy annual).—These dwarf, blue flowers should be grown to attract the bees. All the varieties flower early in the year and continue right through the summer. The average height is 9–12 in. *P. tanacetifolia* (mauve) and *P. campanularia* (blue) are the best known.

PHLOX DRUMMONDII (half-hardy annual).—Ideal plants for summer bedding or good effects in the rock garden. There are all shades of white, pink and red and will flower in the garden from June onwards, from February sowings.

PLATYSTEMON CALIFORNICUS (hardy annual).—This dwarf plant is useful for edgings of the rock garden. It bears masses of yellow flowers all the summer and grows about 1 ft. high.

POLYGONUM (hardy annual).—There are a few tall-growing varieties, 2½ ft. with pink flowers, June to September flowering.

POPPIES (hardy annual).—These dainty flowers should be sown where they are to bloom, and thinned out to a foot apart. They will then produce masses of soft yet bright flowers above their very dainty foliage. Ideal for cutting, if gathered after sunset or before the morning sun is on them. Dead flowers should also be removed to prolong the flowering season. The Shirley strains are the most pleasing; most are about 2 ft. high but there are some dwarf varieties.

FLOWERS FROM SEED

PORTULACA (half-hardy annual).—Grows only 6 in. high and makes a charming white, red or yellow carpet of bloom from June to September.

PRIMULAS (greenhouse annuals).—Some of the finest flowers for greenhouse decoration are to be found amongst these flowers. There are single and double varieties of *P. sinensis*. *P. stellata*, a form of *sinensis*, can be obtained in many colours, and all varieties are extremely graceful and ideal for greenhouse and table decoration. *P. obconica* also has several varieties in all shades of red, pink and lilac. Seeds sown in the early months will give plenty of bloom the following autumn, and the long sprays are useful for cutting. *P. malacoides* is the popular type for the amateur's greenhouse. The soft lilac and pale pink flowers rise above a rosette of soft green leaves, forming a charming pot plant.

RHODANTHE (half-hardy annual).—Everlasting flowers, very useful for indoor and greenhouse decoration. They grow 9–12 in. high with rose or white flowers, either single or double.

RUDBECKIA.—There are annual and perennial varieties of this useful border plant. All have golden or lemon-yellow flowers with a dark brown disk and are autumn-flowering, growing 18 in. to 2 ft. in height.

SALPIGLOSSIS (half-hardy annuals).—Are often seen as greenhouse plants, but are very effective planted out in the summer beds or borders. The flowers in all shades of blue, red, white and brown, grow about 3 ft. in height. February sowings under glass will give plants time for planting out in May. August and September sowings will give blooms under glass the following spring.

SANVITALIA PROCUMBENS (hardy annual).—This dwarf plant grows only 6 in. high and can be used for edgings or the rock garden. It has yellow flowers from June to September.

SAPONARIA (hardy annual).—The variety *S. vaccaria* grows 2 ft. high and is of great use for greenhouse decoration or for a wild corner of the garden. It has rose-pink flowers from June to August, but successional sowings are often made to prolong its flowering season. The dwarf varieties such as *S. calabrica* grows 6 in. high and can be used on the rock garden. It flowers from June to October and has rosy-red flowers. There are also perennial varieties, which can be raised from seed.

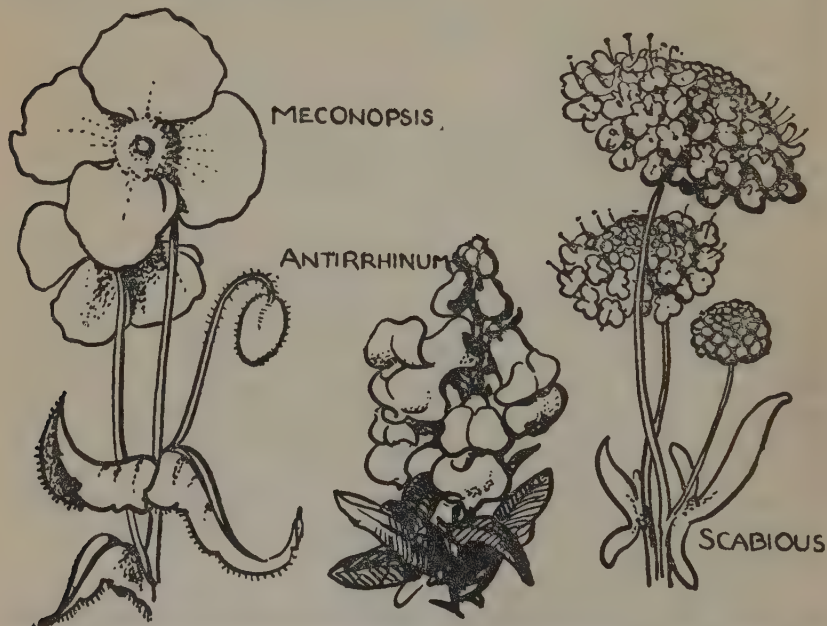
SCABIOUS.—These are usually grown as annuals, and there are now some delightful shades to choose from. These include soft and deep red, mauve, very deep purple, cream and white. All grow about 3 ft. and as the flowers are carried on long slender stems they are ideal for cutting. There are also perennial varieties.

SCHIZANTHUS (half-hardy annual).—These well-known flowers are grown chiefly for greenhouse display. The *wisetonensis* type have many delightful colours, pink, red, crimson, yellow, bronze and white. Seeds

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sown in February with a little heat will give blooms in summer, and August sowings will provide colour throughout the winter and early spring months. The *retusus* type also includes many shades of colour, and the orchid-like flowers are very attractive either in the border or greenhouse. All grow from 1½-4 ft.

SCHIZOPETALON WALKERI (hardy annual).—This is sweetly scented and makes a delightful edging plant for beds near house windows. It grows 9 in. high and has white flowers.



A bed of blue Meconopsis or mixed Antirrhinums or Scabious makes a fine display in the summer garden

SHORTIA CALIFORNICA (hardy annual).—A useful edging plant growing 9 in. high and with a mass of golden-yellow daisy-like flowers.

SILENE.—Most of these are hardy annuals, growing from 4 in. to 1 ft. in height. All are suitable for edgings or the rock garden, and the really tiny ones can be used in the crevices of paving. All have red or pink flowers and bloom from spring right through the summer.

STAR OF THE VELDT. See **DIMORPHOTHECA**.

STATICE.—There are some annual varieties as well as perennial. *S. suworowii* is used a great deal for table decoration and as pot plants for the greenhouse. It has rosy-red flowers and grows 18 in. high. *S. sinuata*, the large-flowered sea lavender is the variety used as an ever-

lasting decoration when cut. The flowers start flowering in June and there are yellow, white, rose and mauve shades.

STOCKS, *Ten-Week Varieties* (half-hardy annuals). These are sown under glass in March for early-summer flowering. They grow 1 ft. to 18 in. in height and named varieties in all shades are offered by seedsmen. *Intermediate Stocks* follow the ten-weeks into bloom from February or March sowings and are at their best in July and August. They are invaluable for summer bedding, growing about 12 in. high and flowering right on until cut down by frosts. They are half-hardy annuals. *East Lothian Stocks* are really half-hardy biennials, but are often treated as half-hardy annuals. Late sowings can be used for greenhouse decoration, but earlier sowings are very useful for beds and borders. *Brompton Stocks* or Spring-flowering (half-hardy biennials) should be sown in July, thinned, wintered in a frame and planted out in March, for May, June and July flowering. They grow 18 in. to 2 ft. high. *Winter-flowering Stocks* (half-hardy annuals) are sown in June or July and grown on in pots for indoor decoration in the cool greenhouses, where they are valued for the delicious scent. They grow 1-2 ft. high and can be obtained in yellow, red and white shades. *Night-scented Stock* (hardy annual), scented, is sown where it is to bloom.

SUNFLOWER (hardy annual).—The large-flowered varieties are ideal for bold displays in the flower border or they can be used as plants to screen out unwanted vistas in the garden. Besides the usual yellow colours there are now magnificent red, rose and orange in single and double varieties. These grow from 3-10 ft. in height. The small-flowered varieties from 1-4 ft. are very useful where bold effects are required on a slightly smaller scale.

SWAN RIVER DAISY (*Brachycome* hardy annual).—These dwarf flowers are useful on the rock garden and also make interesting pot plants. They grow 9 in. high and the flowers, in soft pastel shades, bloom all the summer.

SWEET PEAS. See CHAPTER VI.

SWEET SULTAN (hardy annual).—There are many dainty pastel shades amongst these scented flowers. All grow about 2 ft. in height, and are very useful as cut blooms.

SWEET WILLIAM (hardy biennial).—These can be used to brighten the garden in early spring before the main crop of summer flowers is in bloom. This is obtained by sowing in June or July of the previous year. There are many delightful colours, pink, scarlet, white and mingled. All grow 1 ft. to 18 in.

SWEET WIVELSFIELD.—A new hardy annual. It was evolved by crossing *Dianthus Allwoodii* with Sweet William. It grows 1 ft. high and makes a fine display in the garden beds.

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TAGETES.—These are showy, yellow, autumn-blooming annuals, growing 1 ft. high. Sometimes known as African and French Marigolds.

TITHONIA SERPYLLUM (half-hardy annual).—Grows 6 ft. high and has bright, orange-red flowers. It is a useful annual for filling gaps in the border.

TOBACCO PLANT. See **NICOTIANA**.

TORENIA.—One of the best of the greenhouse annuals, growing 1 ft. high. *T. Fournieri grandiflora* has pale, violet-blue flowers, and *T. Bailloni*, yellow flowers with purple markings. Should be sown in March or April.

TRACHELIUM.—A useful flower for the greenhouse. It has masses of tiny flowers rather like Gypsophila, and can be used in association with other pot plants with good effect. It grows about 18 in. high.

URSINIA (hardy annual).—One of the South African flowers, with bright orange blooms and very finely-cut foliage. Treated as half-hardy, fine plants can be obtained for outdoor planting or for greenhouse pots and this treatment gives the best results. *U. anethoides* is the best known. Several new hybrids of varying heights are now obtainable.

VENIDIUM.—Another South African flower which should be treated as half-hardy annual, and which appreciates a warm, sunny spot in the garden. It grows 2-3 ft. high, has grey, silky foliage and orange, daisy-like flowers. *V. fastuosum* and *V. calendulaceum* are the best. The latter is slightly more dwarf than the former.

VENUS NAVEL WORT (hardy annual).—This has Forget-Me-Not-like flowers, grows 9 in. high and has silvery foliage.

VIOLAS AND PANSIES can be raised quite well from seed. There are many named varieties listed by seedsmen, in a variety of colours. The Alpine Violas or *V. cornuta* are well worth growing, either for the rock-garden or as a spring edging for the bulb beds. If dead flowers are removed they will continue flowering, in the same way as the larger-flowered varieties. (See Chapter VI.)

VIRGINIAN STOCK (hardy annual).—Very easily grown, reaching a height of 9 in. There are red, yellow and white varieties as well as mauve. Successional sowings should be made for bloom all the summer through. It makes a fine edging plant.

VISCARIA (hardy annual).—A very useful summer flower, growing almost anywhere and very effective in the mixed-flower border. There are white, red, pink, blue and scarlet varieties all growing roughly 1 ft. high and flowering all the summer.

WALLFLOWERS (hardy biennial).—Many wonderful colours are now offered by seedsmen. They are unsurpassed for a scented, bright display in the spring garden. A few of the best are Cloth of Gold, Vulcan (crimson), Harbinger (brown) and Fire King (vivid orange). Early-

FLOWERS FROM SEED

flowering varieties which are hardy through the winter from a summer sowing, are also listed together with a few double varieties. The single kinds can be pinched out to produce bushy, dwarf plants for formal bedding. Double-flowered Wallflowers should grow on without a check.

WHITLAVIA (hardy annual).—This is a blue flower suitable for the mixed border. It is rather like the *Gloxinia* in appearance.

XERANTHEMUM (hardy annuals).—These grow 2 ft. high and are grown chiefly for their use as everlasting flowers. They are purple, rose or white, flowering from July to September.

ZINNIA (half-hardy annual).—Rather stiff but very effective bedding plants. Their gorgeous colourings in either single or double flowers can be employed in various colour schemes. There are double and single strains, flowering from July to September, and growing nearly 2 ft. in height. Seedlings are rather inclined to damp off if watered carelessly.

COLOUR SCHEMES IN ANNUAL BORDERS

Shades of Mauve, Blue and Purple

TALL

Aster Mammoth	Lupinus
Cornflower	Poppy
Delphinium grandiflorum var.	Salpiglossis (large-flowered var.)
Larkspur	Scabious (azure fairy)
Lathyrus odoratus (various)	

MEDIUM

Ageratum	Godetia (double mauve)
Anchusa	Godetia (Lavender Gem)
Arctotis grandis	Heliotropium peruvianum
Asperula azurea setosa	Jacoea (double purple)
Aster	Linum usitatissimum
Browallia elata	Linum (Blue Flax)
Callistephus chinensis (various)	Linaria (various)
Centaurea cyanus	Lupinus (various)
Centaurea suaveolens	Nicandra physaloides
Clarkia elegans	Nigella (Miss Jekyll)
Clarkia pulchella	Petunia (various)
Chrysanthemum carinatum	Poppy (mauve queen)
Commelina cœlestis	Poppy (Shirley, blue shades)
Cynoglossum	Salvia farinacea
Datura fastuosa	Salvia Horminum (Bluebeard)
Delphiniums (various)	Scabiosa atropurpurea (various)
Didiscus cœruleus	Salpiglossis
Echium plantagineum	Schizanthus (various)

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Senecio elegans
 Statice sinuata
 Sweet Sultan

Stock (Giant Perfection varieties)
 Trachymene cœrulea
 Xeranthemum

DWARF

Ageratum, Blue Star (light)
 Anagallis grandiflora
 Anchusa capensis (Alkanet)
 Alyssum maritimum (Lilac Queen)
 Aster (various)
 Brachycome Blue Star
 Browallia elata (purple blue)
 Callistephus chinensis (various)
 Campanula Loreyi and attiaa
 Candytuft
 Collinsia bicolor
 Convolvulus (minor)
 Cornflower, Victoria
 Cornflower, King of Blue-bottles
 Eucharidium Breweri
 Gilia tricolor
 Heliotropium peruvianum
 Linaria (mauve)
 Lobelia Erinus (various) (light and dark)
 Lobelia tenuior
 Lupinus

Malcolmia maritima
 Matthiola (various)
 Nemesia versicolour
 Nemesia Suttoni
 Nemophila (of sorts)
 Nemophila insignis (sky blue)
 Nigella, double dwarf
 Nigella damascena (various)
 Nigella (Miss Jekyll)
 Nigella hispanica
 Phacelia congesta
 Phacelia campanularia
 Petunia
 Phlox Drummondii
 Senecio elegans
 Stock (East and Lothian, vars.)
 Swan River Daisy
 Verbena (superb bedding, vars.)
 Viscaria (bright blue)
 Violas (various)
 Xeranthemum annuum

ANNUALS

In shades of Salmon and Rose

TALL

Antirrhinum
 Aster (mammoth)
 Cosmea
 Larkspur
 Lavatera trimestris
 Lathyrus odoratus
 Lupinus
 Nasturtium (salmon queen)

Nasturtium (rosy queen)
 Poppy (double giant)
 Poppy (chamois-rose)
 Salpiglossis
 Scabious
 Schizanthus
 Zinnia (giant double)

MEDIUM

Antirrhinum (of sorts)
 Aster (of sorts)
 Clarkia elegans (double salmon)

Clarkia elegans (double delicate Pink)
 Delphinium gayanum

FLOWERS FROM SEED

Godetia (of sorts)
Hawkweed (pink)
Impatiens Balsamina
Jacobea (single, bright rose)
Jacobea (double rose)
Lavatera trimestris
Lupinus (various)
Malope grandiflora
Nicotiana sanderæ
Papaver (various)

Petunia
Saponaria
Senecio elegans
Silene (Armeria, rose)
Statice sinuata (rose)
Stock (giant perfection)
Salpiglossis (dwarf, rose)
Verbena (various)
Zinnia (double dwarf)

DWARF

Abronia umbellata
Acroclinium
Anagallis tenella
Alonsoa
Antirrhinum (of sorts)
Aster
Begonia (various)
Convolvulus (minor)
Dianthus (various)
Eschscholtzia
Godetia (various)
Iberis umbellata

Lupinus (dwarf)
Matthiola (various)
Nasturtium (dwarf)
Phlox Drummondii
Saponaria calabrica
Statice spicata
Stock (East and Lothian varieties)
Rhodanthe
Tropæolum (various)
Verbena
Xeranthemum annuum
Zinnia elegans

ANNUALS

In shades of Red and Scarlet

TALL

Antirrhinums
Aster
Cosmea
Coreopsis
Helichrysum
Lathyrus odoratus (various)
Nasturtium

Nicotiana
Poppy (giant double)
Salpiglossis
Scabious
Schizanthus Grahamii
Zinnia (giant double)

MEDIUM

Alonsoa warscewiczii
Antirrhinum
Amaranthus caudatus
Aster
Cacalia coccinea
Carnation

Chrysanthemum (various)
Clarkia elegans
Coreopsis cardaminifolia
Emilia flammea
Gaillardia (Indian chief)
Godetia

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Gypsophila elegans
 Ipomœa cardinalis (climber)
 Jacobæa
 Kochia trichophylla
 Malope (red)
 Nicotiana sanderae
 Papaver (various)
 Petunia (of sorts)
 Polygonum orientale

Poppy
 Salpiglossis sinuata (various)
 Salvia coccinea
 Scabiosa atropurpurea
 Schizanthus Grahamii
 Stock
 Verbena
 Zinnia

DWARF

Alonsoa warscewiczii gracillis
 Anagallis grandiflora
 Antirrhinum (Tom Thumb)
 Aster
 Begonia
 Candytuft
 Collomia coccinea
 Coreopsis
 Dianthus hedderwigii
 Dianthus chinensis (various)
 Eschscholtzia
 Godetia (various)
 Iberis umbellata
 Linum grandiflorum rubrum

Lychnis fulgens
 Malcolmia maritima
 Matthiola (various)
 Nasturtium
 Nemesia Suttoni
 Phlox Drummondii
 Portulaca grandiflora
 Reseda odorata
 Rhodanthe
 Saponaria (scarlet queen)
 Stock (East Lothian variety)
 Tropæolum (various)
 Verbena
 Viscaria cardinalis

ANNUALS

In shades of Orange and Yellow

TALL

Antirrhinums
 Chrysanthemum (coronarium)
 Chrysanthemum (golden queen)
 Coreopsis tinctoria
 Helichrysum (golden globe)
 Helianthus annuus
 Leptosyne maritima

Marigold (double African)
 Nasturtium
 Sunflower
 Salpiglossis
 Venidium
 Zinnia

MEDIUM

Antirrhinums
 Aster (primrose queen)
 Bartonia aurea
 Calendula officinalis
 Carnation (marguerite)
 Celosia plumosa aurea

Centaurea suaveolens
 Chrysanthemum (star)
 Coreopsis Drummondii
 Cosmea
 Erysimum (orange gem)
 Gaillardia

FLOWERS FROM SEED

Helianthus annuus	Marigold (double African)
Hibiscus	Rudbeckia (Golden Sunset)
Linaria reticulata	Statice (Bonduelli)
Leptosyne	Stock (giant perfection varieties)
Lupinus luteus	Sweet sultan (yellow)
Marigold (double French)	Zinnia (double dwarf, yellow)

DWARF

Anthemis arabica	Nemesia strumosa (various)
Antirrhinums	Oxalis valdiviana
Calendula	Papaver nudicaule
Chrysanthemum coronaria	Portulaca
Chrysanthemum segetum	Reseda odorata
Coreopsis (golden crown)	Sanvitalia procumbens
Dimorphotheca	Statice bonduellii
Eschscholtzia	Tagetes signata pumila
Layia elegans	Tagetes patula
Limnanthes Douglasii	Tropæolum
Lupinus (dwarf yellow)	Ursinia anethoides
Matthiola (various)	Venidium
Mimulus tigrinus (spotted)	Viola (various)
Nasturtium (various)	Zinnia Haageana (orange)

CHAPTER V

BULBS—GENERAL CULTIVATION—BULBS FOR SPECIAL PURPOSES—LISTS OF POPULAR BULBS—BULBS FOR BEDDING SCHEMES

BULB CULTURE

WHEN the gardener uses the term bulb, he does so with a broad, and certainly unscientific, meaning. But he is right, nevertheless, for he is classing together under a common name plants which have similar cultural requirements. Such dormant root stocks as those of the gladiolus and crocus are not true bulbs, for they are not formed of swollen leaf scales. Nevertheless, to the amateur gardener, such fine distinctions can be regarded as unimportant. If, therefore, the word bulb is somewhat loosely applied to corms and tubers in outlining their cultural requirements, perhaps the strictly scientific reader will ignore the inaccuracy. The garden novice will certainly care very little, so long as he can understand how to make his plants grow and flower.

The chief function of bulbs is to store food for the future use of the plant. This food is not taken directly from the roots, as may be imagined, but is sent back to the developing bulbs from the leaves above the ground. If this fact is understood, the gardener will readily see that the bulb cannot develop normally to its full capacity unless the leaves of the plant are allowed to complete their growth. In most bulbs this does not take place until after the flowering period.

Every kind of bulb has probably its individuality and asks a little different treatment on the part of the gardener from all the others. In general, however, their cultivation is on similar lines, and this will be briefly outlined for the real beginner in flower growing. After all, many hundreds of keen amateur gardeners began by growing a bulb in a glass or pot, when they were very young, for bulb growing is at once the simplest and the most satisfying of all garden ventures.

The average amateur gardener, when thinking about bulbs, concerns himself chiefly with those of the spring-flowering kinds such as Crocuses, Snowdrops, Tulips and Daffodils.

His idea is to cultivate bulbs to furnish a beautiful decoration for his home or garden. It is chiefly with these better-known and more popular bulbs that this chapter will deal.

BULB CULTURE

The cultivation of bulbs can bring much happiness and colour into the life of the cultivator. There is a great sense of achievement in contemplating a garden, or for that matter a house, which is decorated with home-grown blooms. Most of the colours are bright and gay and considerably help to dispel the gloom of wintry days.

The first thing to do is to purchase the bulbs. It is always better, and in the end cheaper, to buy dear ones, as these are more certain to be in good condition. This is a most important point. For one thing, it depends on the food stored in the bulb whether the season's blooms will be good. If, when it is bought, the bulb is in perfect condition, it is safe to say that the future of the plant is secured. No artificial food which you give during the growing period can make up for lack of substance in the bulb.

How to Choose Bulbs.—When selecting bulbs, always bear in mind that they should be firm to the touch, even though small. This is better than buying cheaper bulbs which are larger, but at the same time soft. This point applies particularly to Hyacinths.

There are many kinds of bulbs you can grow, and before definitely choosing, the facilities for growing must be taken into consideration.

If you are concerned with bulbs for garden decoration, the limitations of your purse and your personal taste will be your chief guides. If your money is limited, the best effect can be realized by buying only two or three kinds and grouping them together in a few bold clusters in view of the house. Provided that the groups are not too small, and the predominating colour is a bright one, you will be pleased with the result.

It is always well to remember that selected colours appear to better advantage in small gardens than mixed colours.

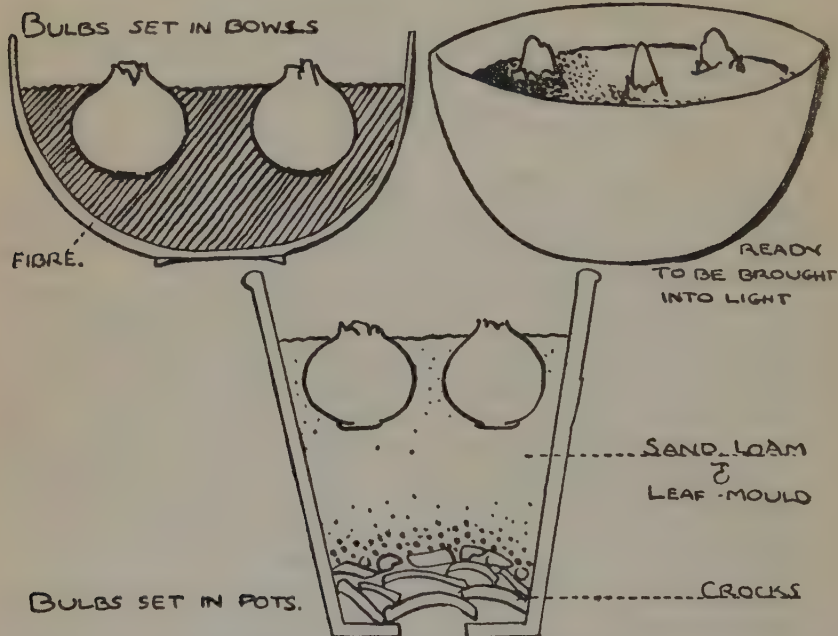
When bulbs are grown indoors, where the atmosphere is constantly warmed, the plan of campaign will be slightly different. The best bulb to grow in an ordinary living-room is no doubt the Hyacinth. Then follow the Pheasant's Eye Narcissi, Trumpet Daffodils and Tulips. These can all be grown in ordinary garden soil in flower-pots, or an alternative method is to grow them in fibre, in glazed bowls. Bowls are usually preferred, partly because coloured bowls can be used, which are more bright and cheery than dull terra-cotta flower-pots, but chiefly because, having no drainage holes, they are cleaner. There is no fear of surplus moisture draining on to the furniture after water has been given.

Bulbs are often grown on the window-sills, which is an easy method and has much to recommend it. In this way Snowdrops and Crocuses can be grown, but these must never be brought into the room until their buds are actually bursting, for they will not stand warm conditions during growth.

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Bulbs in Bowls.—To be successful in growing bulbs in bowls, previous experience is not necessary, and this is therefore a very good way for the novice to start his gardening career.

The bulbs should be bought as soon as possible, as one of the joys of indoor bulb growing is in obtaining early flowers, preferably flowers at Christmas. You will find that the bulbs which give the best results



Bulbs in bowls or pots should be planted with their tips just above the soil level, and kept in the dark for six weeks after planting

when grown in fibre are Hyacinths, Daffodils, Tulips and Crocuses. When buying the bowls to hold the bulbs, it is better to choose those that do not turn in at the rim. Those that do are inclined to allow too much water to remain in the bowl—a state that is fatal to successful cultivation.

It is possible to get bowls in a very wide range of colour and design, but it is better to restrict your choice to one of the duller hues, unless you are absolutely certain of the flowering colour of your bulbs. By doing this you minimize the possibility of a clash in the decorative scheme.

For this method of cultivation, fibre is sold in a specially prepared form by all florists and nurserymen. It should always be used when bulbs

BULB CULTURE

are being grown in bowls, as it retains moisture without becoming stagnant. Ordinary garden soil would become sour with no drainage, and this would of course ruin the bulbs.

At planting time the fibre should be fairly moist—that is, just moist enough to hold together when squeezed in the hand. Each bowl is lined with fibre before any bulbs are put in. Then the bulbs are placed on this, not actually touching each other, and more of the fibre is filled in round them. The tips of the bulbs should just be a little above the level of the rim of the bowl, in the case of hyacinths and daffodils, and level with the rim of the bowl in the case of tulips and crocuses. Never quite fill the bowls with fibre, as this will not allow room for watering. Press the fibre firmly round and between the bulbs, so that they do not touch each other, or touch the sides of the bowl.

After planting, the early treatment of the bulbs in bowls is important. They must be kept in a cool, dark, and airy place, to encourage the bulbs to form roots before the tops commence to grow. This is necessary, otherwise daylight will cause leaves to develop before the root growth has started, and this will result in poor and imperfect flowers.

It is usual to place the bowls in a dark cellar or cupboard for a few weeks and then bring them into the light. Unfortunately, cupboards are often too dry and warm to give the best results, and though watering will alleviate the former drawback, only adequate ventilation will overcome the latter, so that it is really wiser to put the bowls in the cold frame, or even to plunge them outdoors in ashes, taking care that the ashes are at least 6 in. thick above the rim of each bowl. To avoid trouble from heavy rains, lay a sheet of corrugated iron or similar cover over the frame or ashes.

As top growth of the bulbs begins, they may be brought into the light, and by slow degrees into the warmth. The removal of the bowls from darkness to daylight will cause the growing tips to turn green. This natural transformation should only occur slowly, and will do so if the bowls stand for the first few days in a dark part of the room. Afterwards, they should be brought gradually into the sunniest position possible.

It may be mentioned here that after spring bulbs have flowered the bowls can be used if liked for the cultivation of Begonias. These can be grown in fibre in the same manner as Hyacinths or Tulips, except that it is unnecessary to start them into growth in the dark. The tubers are merely laid on the surface of moist fibre, and kept in a warm place. When growth shows, press the tubers down farther into the fibre.

Bulbs Grown in Glasses.—To ensure success in this method, put a small piece of charcoal about the size of a pea into the special bulb glass, which can be bought for a few pence. Fill it with water and set the bulb

COMPLETE GUIDE TO HOME GARDENS

so that the water comes to just below the base of the bulb. This water must be replenished when necessary, but the charcoal will help to keep it sweet and fresh.

Stand the glass in a cool dark place, where the bulb will obtain plenty of air. If you wish to use a cupboard for this purpose, see that air can enter by leaving the door slightly ajar. A cool cellar is better than a cupboard, however. Keep the glasses in the dark until the leaves appear. When the new growth is about $\frac{1}{2}$ in. high, bring the glasses into the light gradually—not immediately. The temperature of the room should be approximately 60–65°. There is no need to give any other special attention except that, as already mentioned, the water should be replenished when necessary. When adding fresh water, care must be taken to use water at the same temperature as the room. A jug left in the room overnight will provide this.

Bulbs in Bowls of Pebbles.—Bulbs grow quite as well in bowls of pebbles or clean sand, with water only, as in fibre or soil. The difference in results is mainly that bulbs so grown are practically useless a second season, since they have exhausted the supply of food in their storehouse, with no opportunity of replenishing it. However, this is relatively unimportant to the gardener who is seeking a substitute for the expensive cut flowers that winter markets offer. He is prepared to let his bulbs give their all in the one season.

The best bulbs to grow among stones are probably crocuses and hyacinths. Hyacinths are easiest, and rarely fail to give satisfaction if they are treated, after planting, in the same manner as recommended for bulbs in fibre. Crocuses are almost always failures in the hands of novices, yet their needs are extremely simple.

The first step is to set the bulbs on and among the pebbles in such a way that the bases are fairly level, and come, preferably, just about on a level with the rim of the bowl, saucer or other receptacle used. Then fill the water in until it almost touches the base of each. Then take the saucer or bowl outdoors, to a cool shed, a garage, or an outer window ledge, and leave it there. Look at it occasionally, and if the water level has dropped, fill in more water. A bowl that stands on a window ledge will probably be refilled often enough by winter rains.

On no account bring the bowl into a warm room. If the weather is very severe, bring the bowl into the coldest room of the house, if you like, where there is never a fire or any other artificial heat. But if you cannot do this, it is better to leave it to freeze.

Not until the colour of the flowers is visible can you feel safe in bringing the crocuses into the warm room. Then, if you introduce them to your family, you will find that the flowers respond by opening with amazing rapidity. To keep them in bloom a long time, spray them

BULB CULTURE

frequently with water, and leave them as near the cool window as you can.

The secret, you see from this, is to keep the Crocuses as cool as they would be in the open garden. Then the flowers come almost before the leaves as they do outdoors (and they take almost as long to develop, too, so you must not expect flowers at Christmas). If you let them grow in a warm room, the leaves are sure to grow above the flowers, even if the flowers come at all, which is doubtful. Moreover, green-flies and other pests find a welcome in the warmth of the room, and, in short, the decorative value of the bowl is quite lost.

Bulbs in Pots.—There is greater variety in the bulbs suitable for ordinary pot culture than in those suitable for bowls. If ordinary pots are used, care must be taken to see that the drainage holes are covered with broken crocks, which will keep them open, and prevent the soil becoming stagnant and sour. A good potting mixture would be composed of loam (i.e. decayed turf), leaf-mould, and sand in equal parts. The sand is necessary to keep the soil open, so that air can circulate, and the leaf-mould is an assistance in retaining moisture. If you have to use sticky clay soil, it should first be either burnt or very well mixed with sand. Ordinary garden soil will do equally well if it is open and crumbly.

It is not necessary to cover the bulbs deeply with soil, the tips of each should just reach the surface, and the soil should only come to an inch below the pot rim, to allow for easy watering. As with bowl culture, the sooner the bulbs are bought the better. When they arrive, pot them at once, and then bury the pots deeply in ashes in the frame, or in some suitable position out of doors. Take them out when growth commences, but if you want a succession of flowers, stand those you wish to keep back in a sheltered position outside. Frost will not harm them, providing it is not too severe, but should the weather become very cold, cover the pots with old mats or sacking at night. Pots of bulbs that have been under ashes are generally washed clean on the outside, and decorated with shell, pebbles, or moss on the soil surface, to hide the ash that clings to the soil.

Forcing Bulbs.—Unless placed in artificial heat, bulbs make very slow progress, and those in pots will bloom very little before those grown out of doors. It is a good plan to introduce small batches of bulbs into a slightly higher temperature from time to time, bringing them on only as quickly as necessary, because the slower the development the better the blooms. By having the main group of started bulbs sheltering under an outside wall, others in a cold frame, some in a warm greenhouse and the remainder in a hothouse, it will be found possible to provide a continuity of bloom for several months. Should the object be to grow flowers for

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cutting, boxes of about 6 in. in depth and of convenient size can be used instead of pots. Do not use much fertilizer for pot culture of bulbs.

Where bulbs are grown in tubs, bone-meal added to the soil at the outset would prove an efficient and suitable fertilizer.

Bulbs in the Garden.—Spring flowering bulbs find a place in every kind of garden—the rock garden, the formal garden, the mixed borders, and the beds in the lawn.

Bulbs flowering in springtime need not interfere with the ordinary planting routine of the flower garden. Bulbs are so accommodating that they may be shifted safely as the seasons change. It is possible to lift them as soon as the flowers fade, and replant them elsewhere—in any odd corner of the garden, where they can continue the normal process of building up the bulb for another season. It is not generally sufficiently understood, that when the flower has faded the plant has by no means finished its season's work.

Bulbs that have bloomed indoors must still be watered, even after the flowers have died, and the leaves must be allowed to die down naturally and not cut off. For a month or two after flowering, the plant is making a fresh bulb for the next season, by storing plant food below the soil.

Planting in Beds.—As the beds where you wish to plant your bulbs are cleared of their summer flowers, clean and dig them well, and add some well-rotted manure. Do not use fresh manure. A dusting of lime over the soil is good. As soon after this as the soil is in the right condition, i.e. mellow and crumbly, the planting of bulbs can begin. Rake down the surface to get it even, and then, place the bulbs on the top of the soil, in the positions in which you want to plant them. By doing this you not only ensure symmetrical designs and even distances, but you can more easily plan definite colour schemes. Then plant the bulbs, using a trowel to dig each hole.

If you put an inch layer of sand all over the bed before you start, you will find that, as you make holes with the trowel, a little of the sand will fall into each. This is all to the good, as this tiny cushion of sand beneath it will prevent the bulb from rotting.

Rake the surface soil level after the planting is finished. When you plant groups in the mixed border you will find it a good practice to put a few pegs in to mark the site, so that you do not forget where they are and disturb the bulbs during the winter clean-up.

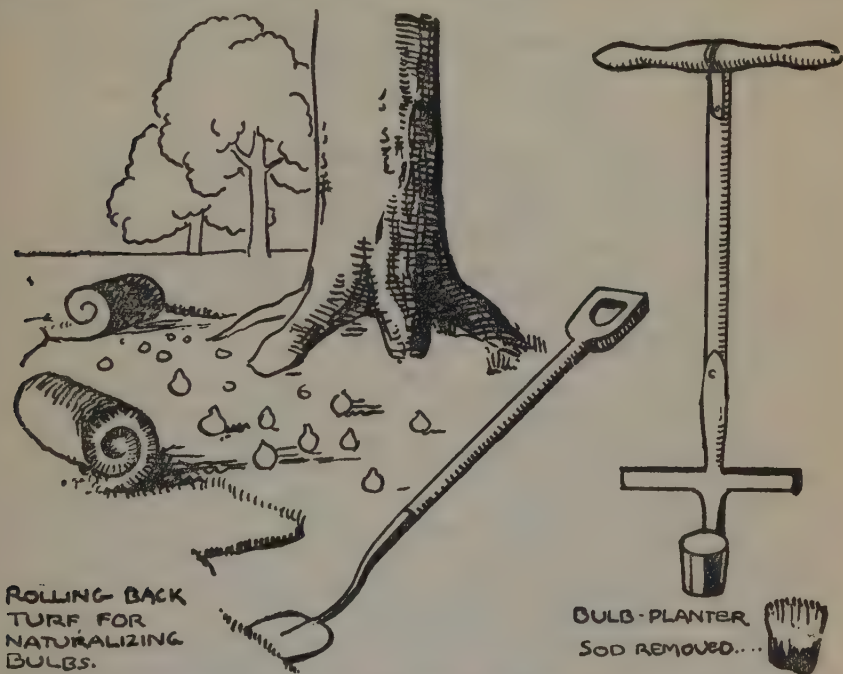
Naturalizing Bulbs in Grass.—Nature is never mean. When she plants she uses a lavish hand, for she knows that clumps, groups or masses always appear better than isolated specimens dotted here and there. A very good method of planting bulbs in grass is to take them in handfuls and then scatter them on the ground. Plant them where they fall, using a trowel for large bulbs, and a dibber for smaller ones (or one of the special

BULB CULTURE

bulb-planting tools). Good bulbs for naturalizing are:—Crocus, Narcissus (all kinds), Galanthus (Snowdrops), Fritillaria meleagris, Anemones.

No better place can be found for Crocus than on the lawn or in grassy banks, because in these places, where they remain undisturbed for years, they increase in numbers from year to year.

Crocuses thrive beneath deciduous trees and are lovely in the orchard garden. When planting any bulbs in grass, strip off the turf, stir the



ROLLING BACK
TURF FOR
NATURALIZING
BULBS.

BULB-PLANTER
SOD REMOVED...

A group of golden daffodils naturalized in grass at the foot of a tree makes a delightful spring picture

soil beneath and then plant the bulbs. Then replace the turf, and roll it well. Remember that the grass must not be mown closely after the bulbs show until the leaves have turned quite yellow, otherwise there will be no flowers the following year. That is one reason why it is best to plant under trees, and to set the bulbs close to the bole of the tree.

Spring Bulbs in the Herbaceous Border.—In planting bulbs in the long borders it is often wise to refrain from attempting any definite colour scheme or design. Bulbs appear to greater advantage if grown in groups than in straight lines, especially in a mixed border. A splash of colour here and there among the green spring shoots of the ordinary

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border perennials is delightful, but odd bulbs dotted regularly along the border are neither impressive nor beautiful.

Bulbs in the Rock Garden.—Many spring-flowering bulbous plants inhabit the pockets of soil on the mountain sides, and they are quite suitable for planting in rock gardens as companions to other spring flowers. There is, however, just one point to be remembered in connexion with bulbs that are grown in the rock garden, and that is that the foliage must be allowed to die down naturally after the blooms have faded. A little liquid manure given at this time helps to stimulate the plants for another spring. The best kinds to use for rockery pockets are the smaller bulbs—Snowdrops, *Scilla sibirica*, *Anemones*, Hoop Petticoat, *Narcissus*, etc.

Bulbs in the Wild Garden.—Although not every garden has its wild corner, there are plenty of gardens where shrubs and trees are grown, in more or less informal fashion, to fill up odd corners, or make a shelter bank between the garden and the roadway. Under trees of this kind, bulbs could well be planted to grow permanently. The kinds chosen should be those which will naturalize well and increase in beauty from year to year. Bluebells do this in their native haunts, so do Winter Aconites, Daffodils and Snowdrops.

It is usually quite unnecessary to prepare the soil of a tiny woodland in any way before planting. All that need be done is to plant the bulbs with a trowel, avoiding any kind of formal arrangement. The cheap supplies of bulbs that are sold off at the end of the season, at low rates, are quite suitable for such plantings, which can in consequence be generous.

Under deciduous trees and shrubs, bulbs are specially satisfactory. They flower brightly while the leaves are absent, and the developing foliage of the shrub or tree above hides the decaying foliage of the bulb, so that it can remain without looking untidy.

Bulbs by the Waterside.—Another place in which bulbs of this kind can be used is in drifts by the waterside. Bulbs will not tolerate a water-logged soil, so that it is useless to plant them in boggy sites, but in the artificial water garden, and even in the natural one, the waterside soil is not always sodden below, and where well-drained subsoil exists, bulbs make a delightful show of early colour, that reflects charmingly in the water of a stream, or the depths of a formal pool.

Bulbs all the Year Round.—It is quite possible to have bulbs of some kind in flower in the garden all the year round. Apart from those that flower in the spring, there are a great number that are summer and autumn beauties. The following is a short list that indicates how varied this class of plants is in time of flowering:—

Spring.—Crocus, *Narcissus*, Fritillary, Tulip, Hyacinth, *Leucojum*, *Anemone*.

BULB CULTURE

Summer.—Lilies, Gladiolus, Begonias, Iris.

Autumn.—Colchicum, Gladiolus, Montbretias.

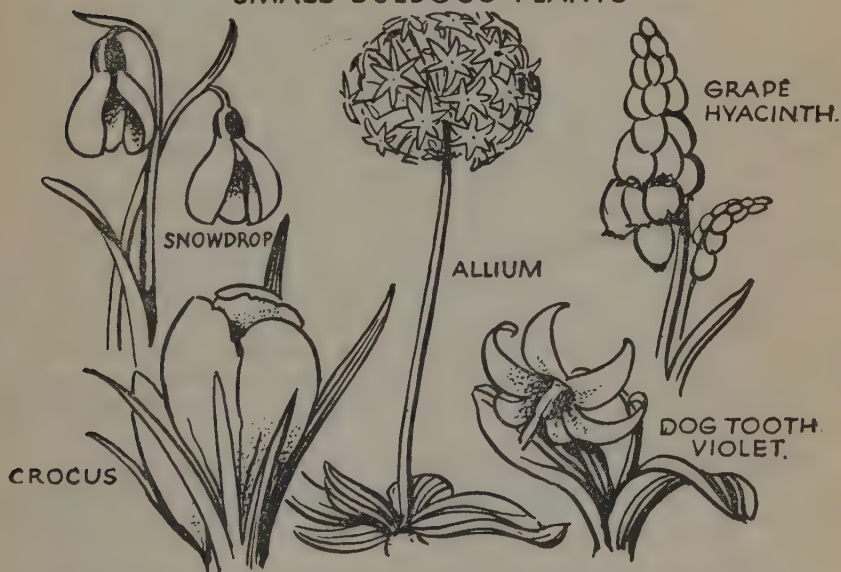
Winter.—Snowdrops, Winter Aconite, Iris stylosa, Iris reticulata.

CULTIVATION OF THE MOST POPULAR BULBS

Special Hints on each Variety of Bulb.—The following is a selection of the most useful bulbs for the amateur's garden, with cultural hints concerning each:

Allium.—This is the onion family. A few species are particularly

SMALL BULBOUS PLANTS



The small bulbous plants can be used for naturalizing and many of them will grow in shady places. A few planted in the rock garden are appreciated in early spring

decorative and are grown commonly in the flower garden. They flourish in ordinary well-drained soil and can be increased either by offsets or by seeds. The best for the amateur's garden are:

A. acuminatum, 6–12 in., deep rose.

A. cœruleum (or *azureum*), 1–2 ft., sky blue.

A. Moly, 1–2 ft., bright yellow.

A. Ostrowskyanum, 2 ft., purple.

Amaryllis (Belladonna Lily).—The Lily commonly grown in gardens all the year round in warm districts such as Cornwall and Devon. It

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has strap-shaped leaves and fragrant, rosy lily-like flowers in August and September. Sometimes called "Cornish Lily." Several modern hybrids are obtainable which are rather more vigorous than the type.

It is best to leave the bulbs undisturbed for four or five years but when transplanting is necessary, do it after the foliage has died down. In dry weather, plants benefit from a mulch of well-rotted manure.

Bulbocodium (*Bulbos*, a bulb, *kondion*, wool).—Small bulbs with a "woolly" outer covering which gives them their name. The species commonly grown in the garden is *B. vernum*, which has small crocus-like flowers of violet colour in January and February.

Calochortus (Mariposa Lily).—These can be grown in the open air though it is common to grow them in pots, or in cold frames, as they have to be protected from frosts. Also they do not like excessive moisture during the resting period. Planting time is from September to the end of November, 3 in. deep and 3 in. apart. Plant in sandy leafy soil and protect during the winter months with strawy manure or dried leaves. They like a sunny situation. They can be increased by offsets. White, yellow and mauve varieties are obtainable.

Camassia.—These grow well in ordinary good garden soil but like a warm, fairly sunny situation. They may be increased by offsets. Modern varieties are obtainable in shades of blue, cream and white.

Chionodoxa (Glory of the Snow).—Perfectly hardy plants suitable for growing in the rock garden or for naturalizing on the lawn. They are best left undisturbed for several years. After planting they can be increased by offsets and also by seeds which, however, are slow in reaching maturity. The flowers are mostly brilliant blue with a zone of pure white in the centre.

Chlorogalum.—These plants are rather interesting because the bulbs of one species *C. pomeridianum* are used as a substitute for soap in their native country. Flowers are purplish white in summer, about 2 ft. high.

Colchicum (Meadow Saffron).—*C. autumnale*, the autumn-flowering colchicum, is the commonest. It is very suitable for naturalizing in grass and is actually a native of meadows in various parts of this country. The flowers are white or purple. Bulbs can be planted as soon as obtainable, in early summer, and will flower in autumn at any time from August to November.

Crinum.—Large bulbs with showy flowers grouped in clusters at the top of the stem. The ideal position for these in the open garden is along the south side of the greenhouse, but in fairly warm sheltered gardens they will grow well in any beds or borders. They like a deep rich loam with abundance of water, and are frequently seen growing by the waterside.

BULB CULTURE

Crocospmia.—One of the parents of the garden hybrid now known as Montbretia. Flowers orange red, 2 ft. high.

Crocus.—The gardener groups crocuses into two sections. Spring flowering and autumn flowering. The spring crocuses are well known. and are obtainable in all shades of yellow, white, mauve and blue. They can be naturalized in grass or grown as border edgings. Set in small groups between plants of grey-leaved pinks they make a border edging which is interesting both spring and summer and not undecorative in winter. In fact one of the chief advantages of crocuses is that they can be so well grown in association with other plants which will follow them in their season of flower. The bulbs are usually set about 3 in. deep and 3 in. apart in August, and should be allowed to remain undisturbed until they become overcrowded.

Autumn-flowering crocus are planted in exactly the same way, and about the same time, or a little earlier, and if they are lifted from the ground after flowering this should not be done until the following May.

Apart from their use in formal and informal gardens, rock gardens, and so on, spring-flowering crocuses are fine for indoor decoration if they are grown carefully. They must not, however, be brought into warm rooms until the flower shows colour. If this precaution is taken they can be grown either in pots of soil, bowls of fibre or saucers containing stones and water, as already described.

Large size crocus bulbs should produce about 10 flowers per bulb during the first season after planting. The amateur is well advised to buy the best bulbs if he wishes for good results from indoor cultivation. Named varieties of crocus are offered by the leading nurserymen.

Some of the best are "Queen of the Blues," "Sultan" (rich purple), "Amethyst" (brilliant blue) and "Snow Storm" (white).

Cyclamen.—Plants with roundish, flattened tubers or corms, with a depression in the middle of each. They have usually rather ornamental leaves, and the flowers are well-known by their curious corolla, which turns backwards and earns them the title of "Butterfly Flowers." Many of the Cyclamen are very fragrant.

Some of the Cyclamen are hardy while others are only suitable for greenhouse or indoor culture. The best time for planting hardy species is when they are resting, that is towards the end of summer and beginning of autumn. They can be planted in a corner of the wild garden (they revel in shade) or in pockets of the rockery. The tops of the corms should be just about level with the soil surface, but during the winter a mulch of leaves or old manure from the mushroom bed will keep away the frost from the corms, and also serve as a stimulant to the plant when it begins to grow in spring.

The hardy cyclamen may be grown under glass if preferred, in pots

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to flower early, that is, during the first three months of the year. Increase is from seed preferably, or by cutting the corms or tubers into pieces, with an eye to each. These pieces are inserted as cuttings in sandy peat under a bell glass. Of the hardy kinds the best to grow are *C. africanum*, *C. Coum*, *C. europæum* and *C. neapolitanum*.

The Persian Cyclamen *C. persicum* (or *C. latifolium*), is usually treated as a greenhouse plant and grown for indoor culture. This is really a perennial and can be grown for several years, but it is recommended that plants should be raised from seeds every year. These are sown in late summer or in autumn, while some can also be sown in January or February.

An ordinary sandy compost, containing some leaf soil, should be used in pots or shallow pans for the seedlings. Space the seeds out about an inch or two apart, and cover them with about their own depth of fine soil. Temperature should not drop below 45°. Germination is slightly irregular, and seed that does not appear to be growing should not be discarded too quickly. Slugs and snails sometimes trouble them. Lime mixed in equal proportions with a little well-rotted manure and some silver sand is ideal for the final potting. To this a little peat moss litter can be added in order to keep the soil rather more open.

The plants are potted as required from June to August and kept as near the glass as possible, in a cold frame. In September they are brought into the greenhouse and again kept near the glass. Plants may be fed with weak liquid manure made from soot and animal droppings when they are nearly in flower.

A good strain of seeds will produce flowers in every shade of crimson, rose, salmon and white, some of the petals being finely fringed. A mixed collection makes a very decorative shelf in the greenhouse.

Eranthis (Winter Aconite).—Charming little flowers with long golden globes, beneath which is a finely cut circle of green. They are the earliest flowers of the year almost always appearing round about New Year's Day. The only secret of cultivation is to plant them early, that is as soon as obtainable and to leave them alone for many years at a time. They will gradually increase in number and improve in quality. Plant from 3-4 in. deep and 3-4 in. apart.

Erythronium (Dog's Tooth Violet).—These are perfectly hardy and very suitable for rockeries and for the edge of the wild garden or shrubbery. They can also be naturalized in grass or woodlands. They like light loam, preferably with the addition of a little peat and leaf-mould. Most species and varieties flower in spring. The colours include rose, purple, white and orange.

Freesias.—These can be grown either in the open garden or indoors, but as they are not quite so hardy as most of the spring-flowering bulbs

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it is only in the very warmest districts, where the soil is light, that the Freesia can be successfully cultivated as a garden plant. A light top-dressing of coconut fibre is an excellent winter protection in the open. When grown in pots its culture presents little difficulty to owners of cold frames and greenhouses.

Freesias are not quite so amenable to room culture, however, as are Hyacinths and Daffodils. July is the best time to begin. It is best to grow Freesias in soil in pots, not in fibre. The soil should preferably be of a light sandy nature, but with dried cow manure crushed and a little bone-meal added. Half a dozen Freesias can be grown together in a 5- or 6-in. pot, which should stand in the cold frame after potting until the tops begin to show. No further attention need be given until flowers are visible, after which frequent applications of *weak* liquid manure given after watering will increase the size of the flowers.

Staking is necessary, and is best done by using split bamboos round the sides of the pot, with raffia round the whole.

Some of the modern Freesias are of wonderful colouring, particularly the British Freesias raised by our own hybridists. These are more expensive than the old cream type, and some of them have one defect: that is, they lack fragrance. As the scented Freesias are so generous with their fragrance, however, the owner of a large collection will not miss the fragrance from a few of the coloured beauties. Freesias recommended to the amateur are:

F. refracta (white and orange). May to August, 1 ft. and its varieties "Leichtlini" (yellow, cream and orange), alba (white), and odorata (yellow and very fragrant).

Some of the newer hybrids are:

APOGEE. Large flowers of soft primrose-yellow.

BEAUTY. Very free flowering, with massive foliage and large flowers of soft, rosy pink.

BUTTERCUP. Tall and early flowering. Large flowers of rich primrose-yellow with deep orange lip. Scented.

GLOWING EMBERS. Medium-sized flowers on stiff stems.

RED INDIAN. Flowers of medium size. Garnet red.

ROBINETTA. Well-opened flowers of dull rosy-red; one of the deepest coloured Freesias.

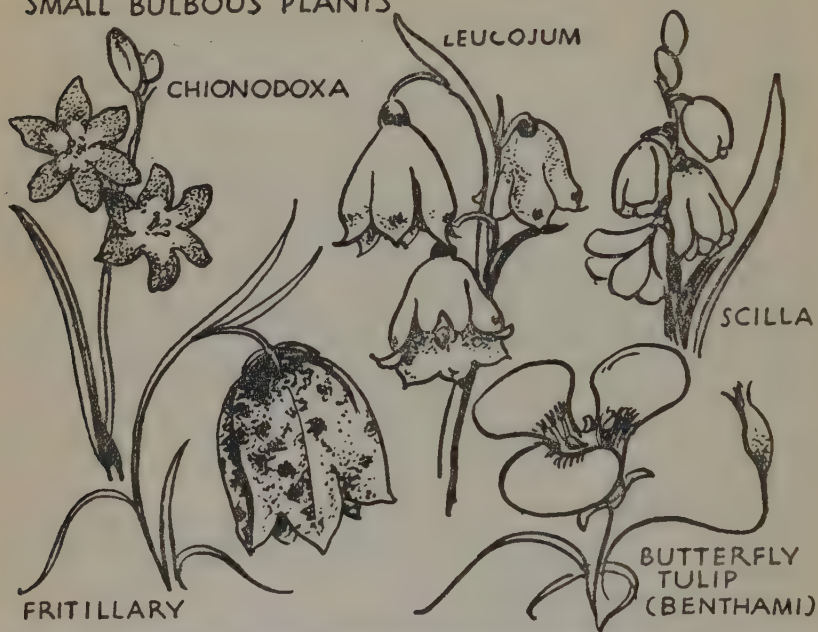
Freesias can be grown easily from seed sown in spring and grown on and wintered in the same pot, to flower, without transplanting, the second year.

Fritillaria.—The bulbs belonging to this genus produce plants of an extremely varied appearance. On the one hand there is the tiny "Snake's Head Fritillaria," *F. meleagris*, which is grown in grass or on the rockery, and has tiny flowers beautifully veined with purple on a yellow-white

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ground: some varieties are more nearly rose and white in colour. These Snake's Head Fritillarias should be planted where they are to remain for some time. They prefer a moist situation and are often found in meadows by the side of rivers that overflow their banks annually.

SMALL BULBOUS PLANTS



Daffodils, Hyacinths and Tulips are not the only spring bulbous flowers. Those shown here can all be used for various purposes in garden design

On the other hand there are the tall "Crown Imperials," *F. imperialis*, which send up flower spikes 2-3 ft. high, carrying a bunch of green leaves at the top, and immediately below these a cluster of large drooping bell flowers, varying in colour from yellow to crimson. These grow in any well-dug garden soil.

Galanthus (Snowdrop).—No garden should be without its collection of Snowdrops if only because they are the earliest flowers of the year and are welcomed always as the real "Heralds of Spring." Moreover, the Snowdrop is so happy in our British gardens that a few planted one season will, in a few years, make a surprisingly showy group. They are best planted in some situation where they can remain undisturbed. For instance, a liberal handful of bulbs set under each fruit tree in the orchard

garden is most successful. Early planting is best in the case of Snowdrops, that is, not later than September.

G. nivalis is the common Snowdrop, but *G. Elwesii* is rather larger, and is favoured by many gardeners. The double form of the ordinary Snowdrop is also popular. Snowdrops can be planted as close as 2 in. apart and about 3-4 in. below the surface soil, that is, rather deeper in proportion to their size than most bulbs.

Galtonia (Cape Hyacinth).—*G. candicans* is also known as *Hyacinthus candicans*.

Bulbs are obtainable at cheap rates and make a very decorative appearance in the mixed border, where they should be grown in groups. They should be planted in March about 4 in. deep and 9 in. apart.

If they can be put into deep, rich sandy loam with leaf-mould and a good top dressing of manure each autumn or winter they will make a grand show.

G. candicans is the best-known species. It has long strap-shaped leaves and bears flowers on erect stems about 3 or 4 ft. high. Flowers somewhat resemble a greenish-white hyacinth.

Gladiolus. See CHAPTER VI.

Hyacinthus (Hyacinth).—These are such popular well-known bulbs that they need no description. They are the finest of all the spring-flowering bulbs for cultivation in the home, in special hyacinth glasses, or in bulbs of fibre, or in pots of ordinary soil. In the garden they are used freely for bedding schemes and for this purpose they are planted about 6-7 in. apart and 4-6 in. deep according to size. They flower more effectively planted in single colours than in a mixture, but it is not necessary, nor desirable, to obtain the largest size bulbs for bedding schemes. Bedding Hyacinths are obtainable in separate colours at reasonable rates, and make a satisfactory and uniform show in the open garden. They can be left in the garden without lifting after flowering, but as a rule they deteriorate in quality from year to year whether they remain in the soil or are lifted, dried and stored. A few varieties seem to flower year after year in succession better than others. One which had proved successful in this respect is "Gertrude," a bright pink variety showy for indoor cultivation as well as for outdoor.

Useful varieties for the attention of the amateur gardener are;

CITY OF HAARLEM, pale yellow; large spike.

KING OF THE YELLOWS, extra fine.

LADY DERBY, delicate pink; splendid for early forcing.

ROSY GEM, the finest of the red Hyacinths. Single flowers with large waxy pink bells.

LA GRANDESSE, pure white; one of the best and largest, for exhibition.

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L'INNOCENCE, pure white.

BISMARCK, bright porcelain-blue.

ENCHANTRESS, delicate porcelain-blue,

EXCELSA, one of the most beautiful of pale blue hyacinths.

BLUE GEM.

LA VICTOIRE, the finest dark red hyacinth; bright orange-red; good for early forcing.

ROI DES BELGES, fiery scarlet.

IVANHOE, violet-blue, almost black; large bells.

KING OF THE BLUES, fine indigo-blue;

MAUVE QUEEN, purplish-mauve.

INDIGO, deep rich blue.

ROMAN HYACINTHS (white) and the **MINIATURE HYACINTHS** (in separate colours) should also be grown for early blooming.

Iris. See CHAPTER VI.

Ixia.—South African bulbs, excellent for pot culture in cool green-houses, and producing masses of flowers suitable for cutting. In favoured localities they can be grown outdoors in the open garden, but the soil must be warm and light, as cold, clayey soil is fatal. They are planted between November and January, about 3 in. deep, in beds of light loam, with a handful of coarse sand over and under each bulb. Protect them from cold winds by a mulch of dry litter which should be removed about March when the leaves are showing. There are several varieties, but all are about 1-2 ft. high. Colours vary from lilac, orange, yellow and red to one variety which has green flowers. This is grown more as a curiosity than for decoration.

Leucojum (Snowflake).—The most common species in the garden are the *L. Æstivum*, the summer Snowflake and *L. vernal*, the spring Snowflake. The spring flower is greenish-white, while the summer one is pure white. The bulbs can be increased by offsets.

Lilium.—Lilies are perhaps the most popular of garden flowers, although at the same time they have appeared to be neglected. The reason is perhaps that some species are difficult to cultivate in the ordinary garden, and need special treatment, or special soil. This difficulty is, however, greatly overrated and amateurs would do well to add more lilies to their collection of summer flowers. Most of them are perfectly hardy, and even those which are slightly tender can be well protected in winter by a mulch of dried leaves or light litter over the soil surface. In gardens where even this protection is insufficient, the bulbs of the more tender species can be lifted after the foliage has died down, and stored in dried soil until spring.

The best position for lilies of all kinds is in a sunny border among other growing plants such as dwarf shrubs. In their native countries

BULB CULTURE

Lilies grow in such places as meadows, where the grass is tall, and where the young stems get a certain amount of protection from excessive sunshine while they are developing. Lilies will not flower well, however, unless they can get their heads into the sunshine; that is why dwarf shrubs make suitable companions.

Planting time for Lilies is usually as soon as the bulbs can be bought.

Lilium candidum the old favourite in the little cottage garden, which is such a fine feature in the mixed border, does not like rich soil and is best planted immediately after the flower stems have faded, that is at the end of July or in August, certainly not later than September. These Lilies can be grown for at least six years without lifting and dividing, and will be found to increase in beauty from year to year. (See CHAPTER IV.)

Other Lilies can be planted in autumn or in spring, according to variety and according to when they are obtainable. Large consignments of Lily bulbs come over each year from Japan and arrive in this country about New Year. These varieties cannot be planted until spring, but it is best to keep them stored in soil for a few weeks before planting. As a rule they arrive in a somewhat dried condition, and if the bulbs are set in boxes of slightly moist soil, they are in a better condition for planting when the weather breaks. Nearly all Lilies are readily increased by offsets from the bulbs. They are also easily enough increased by seeds which, however, in some cases, take several years to reach maturity. Of late, however, raising Lilies from seed has become far more popular, chiefly owing to the fact that some varieties come more quickly to flowering condition. For instance, *L. regale* seed will flower the season after it is sown. This method is so interesting that the amateur gardener is advised to try it. Seeds are sown in ordinary seed pots in the greenhouse just as those of other hardy plants, seedlings being kept under glass during the first winter and potted up singly as required.

Lilies are divided mainly into two classes, as regards cultural treatment. Some are stem rooting, that is to say, after the bulb has been planted it develops roots not only from the base of the bulb as in the case of a Hyacinth, but it also develops a number of roots from the stem above the top of the bulb. It is obvious that such varieties need to be planted deeper in the soil than in the case of those which grow roots from the base of the bulb only. This distinction in habit of growth also makes a difference in the treatment of the Lily in pots. In the case of stem-rooting varieties grown in pots it is a common practice to pot the bulb in the ordinary way, but in a pot large enough to allow the soil surface to be at least half-way down in the pot.

In the matter of soil, Lilies vary somewhat in their requirements. The Madonna Lily will not thrive unless there is a proportion of lime in

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the soil. Certain other Lilies also like some lime, or are not adverse to its presence. But some Lilies will not tolerate any lime and require a sandy, peaty loam.

The brief list of the most popular and easily grown Lilies is given below together with a note on the cultural requirements of each:

L. auratum (Golden-rayed Lily of Japan) has snowy-white flowers conspicuously marked with yellow, purple and crimson. It needs a light loam and leaf-mould in a partially shady position.

L. a. platyphyllum, has larger flowers, but not so freely spotted as *L. auratum*. 8-10 ft. high.

L. Batemannæ. Needs a sunny or partial shady position in loam and leaf-mould. Flowers, a delightful shade of glowing apricot.

L. Brownii. A rather rare variety. Has flowers 10 in. long of pure white, outside deep chocolate-brown.

L. chalcedonicum. One of the easiest to grow. Can remain undisturbed for several years. Flowers of rich scarlet.

L. croceum (the Orangeman's Lily). Rich orange flowers spotted black, growing to a height of 3½ ft. Formerly very common but now scarce. (Those sold under this name in cheap markets sometimes turn out to be *L. umbellatum*.)

L. Hansonii, an easily grown species, thriving in either sun or shade. Golden yellow flowers, 4-6 ft. high, in June and July.

L. Henryi, Japanese species growing 10-12 ft. high. Easily grown in almost any position, preferring a friable loam. Large flowers of deep orange-yellow in August and September.

L. Krameri, likes a shady position in loam, sand and leaf-mould. Large trumpet flowers pale pink, rose-blush or white.

L. longiflorum nobile, easily grown in pots for house decoration, or in the herbaceous border. Best in loam sand and leaf-mould. Large snow-white flowers about 7 in. long, 2-3 ft. high.

L. Maximowiczii, a late flowering Lily with vivid orange-red flowers. This variety prefers a partially-shaded position in loam and leaf-mould.

L. martagon, favoured for border decoration. Flowers of light purple-rose, freely spotted dark purple.

L. m. album (The Old White Martagon), an exceptionally fine variety with snow-white flowers, beautifully reflexed, showing its rich golden yellow anthers.

L. philippinense, needs sandy loam, full sun. Invaluable for pot culture. Flowers snow-white, 2½-3 ft., in July and August.

L. pyrenaicum, a good border lily which can be successfully grown in any sunny border. Has crowded heads of small reflexed flowers of pale yellow, freely spotted maroon.

L. pardalinum requires a damp position, sandy peat, with plenty of

BULB CULTURE

drainage. Large pendant flowers of bright scarlet, shaded orange, freely spotted maroon. 6-10 ft. high.

L. regale, the finest of all Lilies for the ordinary garden. Does not object to lime, but must not be dressed with manure. Can be raised from seed. July. 3-6 ft. high.

L. speciosum, very beautiful for border decoration or pot culture. Easily grown in any sunny border in good friable loam but is even better for pot culture. The variety "rubrum" is rather more colourful than the type. August-September. 3-4 ft. high.

L. magnificum, ruby-red, margined with white, each flower 8 in. or more across.

L. m. melpomene, stout branching stems bearing large open reflexed flowers, rosy-crimson spotted purple.

L. superbum, a species fond of a damp spot in leaf-mould or peat. Large flowers, brilliant orange freely spotted maroon-crimson. July-August. 6-8 ft. high.

L. tenuifolium, a dainty Siberian species, growing only 18-24 in. high. Has slender leaf stems bearing scarlet flowers. This species prefers a sunny, well-drained spot in sandy loam and leaf-mould.

L. Thunbergianum, a dwarf species growing 9-15 in. high, admirable for the rockery or border, also easily cultivated in pots. Prefers a sandy loam in a sunny position. The cup-shaped flowers, produced in July, are in shades of orange and red. "Orange Queen" is one of the best varieties.

L. T. semi plena is a very pretty semi-double variety.

L. tigrinum, needs a sunny or partially shaded position in good loamy soil. Invaluable for border decoration. Produces gaudy flowers in August and September.

L. t. plenum, the old double Tiger Lily, with large flowers of brilliant orange scarlet freely spotted black.

L. t. giganteum, the giant of the group, produces stately stems 5-6 ft. high, bearing flowers of bright orange-scarlet spotted maroon, during September.

L. umbellatum, these are hardy, easily grown, thriving in almost any soil, and preferring a sunny position. Invaluable for pot culture. Orange-red flowers during June and July.

L. u. erectum, vigorous growing variety with large open flowers of rich red. 2 ft. high.

L. u. grandiflorum, large, open, cup-shaped flowers, of bright red flushed orange, 2 ft. high.

L. u. splendens, large, open flowers, reddish vermilion flushed orange.

Montbretia.—To this genus belong a number of good garden hybrids raised by crossing *Crocsmia aurea* with *Tritonia Pottsii*. They are very

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showy in the mixed border and some modern varieties have flowers that are almost bright red instead of the old orange-yellow type. The roots are rather curious. They are corms which give rise to underground stems, on which more corms develop. Where increase of stock is desired, and in fact, in most cases, it is best to lift the plants about the middle of April, divide them, replant them, allowing more room. This not only increases stock but it also prevents overcrowding. The divisions should be transplanted to about 9-12 in. apart in good soil. If spring division is not practised, the corms can be lifted in autumn after the foliage has died down and replanted 9 in. apart. Of the modern hybrids some of the finest and showiest for the mixed border are:

Fiery Cross
Fire King
Geo. Davison
Germania
His Majesty

King Edward
Lord Nelson
Rayon d'Or
Star of the East

Muscari (Grape Hyacinth).—Dwarf bulbous plants, with spikes of tiny bell flowers, packed closely together. They like deep sandy loam with manure and leaf-mould, and are best planted in bold patches and left to grow on for several years in succession. They can be increased by offsets, or by seed, which takes three or four years to reach flowering conditions. The best known variety is "Heavenly Blue."

Narcissus.—A large genus of plants, which includes Daffodils, Jonquils, the popular "Pheasant Eye" Narcissus, and miniature species such as the Hoop Petticoat Daffodil, which are suitable for cultivation on rockeries. The amateur sometimes calls only the Pheasant's Eye Narcissus by this name, but actually the genus Narcissus includes all the groups mentioned. Daffodil is the common name, mostly used for the trumpet varieties of the Narcissus, but sometimes also for the short cup, all-yellow, varieties. Polyanthus varieties, that is, varieties which have more than one flower on a stem, are commonly called Jonquils.

Classification.—Narcissus are usually classified as follows:

(1) Yellow, White or Bicolour Trumpets.—These have trumpets as long as, or longer than, the perianth segment.

(2) Yellow and Bicolour Short Cup or *Incomparabilis*.—In these the cup is not less than one-third, but less than equal to the length, of the perianth segments.

(3) Yellow and Bicolour *Barrii*.—In these the cup should be less than one-third of the length of the perianth segments. They have as a rule bright-coloured cups, and perianths bright yellow or white.

(4) Large and Small crowned Leedsii, or *Eucharis*-flowered.—Here the outer petals are white, with white or pale yellow or cream cups, sometimes tinged pink.

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(5) Triandrus.—With short cup, and reflexed outer petals.

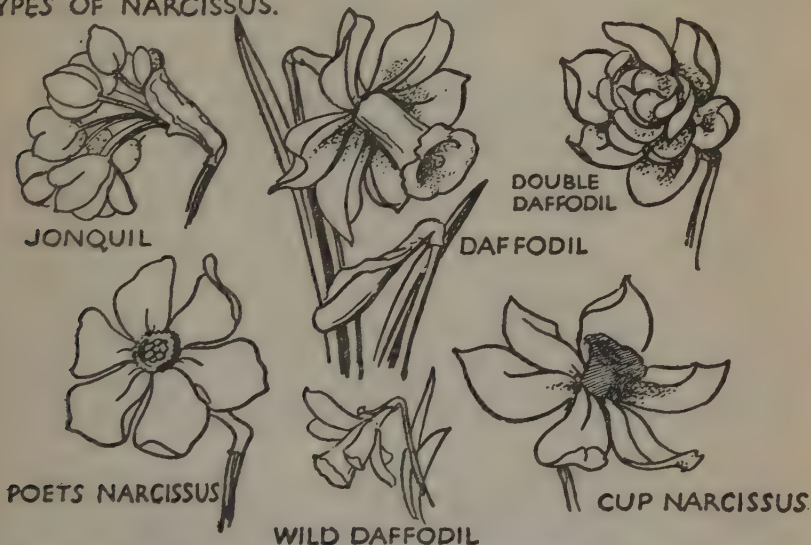
(6) Cyclamineus.—Pale yellow with darker and very narrow trumpet.

(7) Jonquil flowered, Tazetta or Polyanthus.—All bunch-flowered and white or yellow with yellow cups.

(8) Poeticus or Poet's Narcissus.—Petals white or yellow, with red eye.

(9) Double.

TYPES OF NARCISSUS.



There are many distinct types of Narcissus of which the daffodil is one. The length of the trumpet decides to which type a variety belongs

Culture.—Daffodils are probably the best of all outdoor bulbs partly because they are natives of Britain and therefore not only flower well but increase in quantity from year to year. They are not particular as to soil but like it well drained and deeply dug.

All kinds can be naturalized in grass, so long as the grass is not cut until the leaves have turned quite yellow or brown.

For exhibition culture, the secret of success is to plant early. If a narcissus bulb is dug up almost immediately after the leaves have disappeared it will be found that it is already putting out new roots from the base. This means that the actual resting period is short although the top growth disappears for a time. Exhibition growers usually plant or pot their bulbs in August.

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The novice plants right up to Christmas. Late planting is good enough for the cheaper supplies of bulbs which are put into woodland gardens, shrubberies or lawn to naturalize and stay for several years.

All varieties of Daffodils grow reasonably well in pots or bowls. Beyond potting up rather more deeply than is necessary with hyacinths they need no special treatment. A rather sandy, leafy loam is preferable if ordinary pots are used, and the bulbs should be set so that the tips just show above soil surface. They should not actually touch each other, whether in pot or bowl, but otherwise can be quite close together.

In pots, at least 2 in. of soil should be below the base of the bulb and all pots should be provided with sufficient drainage crocks.

Normal treatment for bulbs indoors is good enough for any variety of narcissus, and though most of the family will grow better and stronger if they are grown in fairly cool conditions, at least in the early stages, one variety—"Paper White Narcissus"—is notorious for its ease in forcing into bloom before Christmas. Kept in soil or fibre at the beginning of August it will usually be in flower before the end of November, or in the first week of December. Where ornamental bowls are used they should be at least 4 or 5 in. deep, except for the dwarf rockery kinds. In bowls or pots, narcissus are best staked with thin split bamboos, but in the open garden they need no staking. In fact the nodding of Daffodils in the spring breezes is one of their chief charms.

Although narcissus can be used in any odd corner of the garden, in the rock garden, the wild garden, the water garden and in the mixed border they are equally suitable for formal planting in beds on lawns or in sunk gardens. It is best to associate them with some dwarf carpet plants such as Forget-me-nots, or Primulas, and the tall trumpet Daffodils and Narcissus also mix happily with the darker coloured Wallflowers, especially the early variety "Harbinger," which is almost a winter flower.

Recommended varieties of modern Narcissus for various purposes are as follows:

FORMAL BEDDING

"Conspicuous"—yellow with red crown	"King Alfred"—deepest yellow
"Emperor"—pale yellow	"Lady Moore"—white with red crown
"Golden Spur"—golden yellow	"Sir Watkin"—pale yellow with darker cup
"Horace"—white with red bordered cup	"Van Sion"—double yellow

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EXHIBITION

"Albatros"—white almond-shaped perianth segments and citron cup, edged red

"Beersheba"—white trumpet daffodil

"Bernardino"—white perianth, spreading, crown flushed apricot-orange

"Cræsus"—pale lemon perianth segments, flat crown of deep orange-red

"Firetail"—cream white perianth, deep red eye

"Glorious"—*Poetaz* with white perianth, orange-scarlet cup

"Red Guard"—*Poeticus*, orange-yellow perianth, scarlet cup

"Sunrise"—*Bicolor Barrii*, cream-white perianth, orange cup

"Will Scarlet"—*Incomparabilis*, rough white perianth, orange crown

FOR FORCING

TRUMPETS.—Christmas Glory; Golden Spur; King Alfred.

BARRII.—Conspicuous; Lady Moore.

INCOMPARABILIS.—Cardinal; Sir Watkin; Yellow Poppy.

LEEDSII.—White Lady.

POETICUS.—Horace.

DOUBLE.—Twink.

Ornithogalum (Star of Bethlehem).—Useful for groups in the mixed border or for naturalizing. A few kinds are somewhat tender and need a little winter protection in the form of leaf litter. Ordinary garden soil is suitable for all the genus. The flowers are mostly white or greenish-white.

Schizostylis.—The best species of this genus for growing in the ordinary garden is the South African *S. coccinea*. This has fleshy rootstocks, not exactly bulbous, and at the end of the year, usually from September to December, scarlet flowers, each about 1 in. across, are held well above the sword-like leaves, somewhat after the fashion of the gladiolus flowers. Unfortunately *Schizostylis* can only be grown well in mild gardens, where the soil is warm and fairly light. If they are to be planted in gardens where the natural soil is heavy clay, they should be treated like Lilies, and given a special compost made of moist loam, peat leaf-mould and silver sand. A position under a south wall is ideal. Plants can also be grown very well in pots for greenhouse decoration. Increase in the same way as *Montbretias*, i.e. by division.

Scilla (The Bluebell family).—These bulbs are excellent for naturalizing in grass or under woodland trees. They need to be planted in liberal quantities to get good effects, and it is better to make one large group than to dot the bulbs here and there all over the garden. They also grow well in pots, bowls of fibre or shallow saucers of pebbles and

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water. To grow them in pebbles and water they should be set so that the base of the bulb almost reaches the water, and kept in a cool room until the flowers begin to show colour. In soil or in fibre they are treated in exactly the same way as other indoor bulbs.

S. sibirica is the species used for indoor water culture in this way. *S. campanulata* (*hispanica*) is a bluebell suitable for massing in the same way as our native Bluebell, but it is more striking and decorative. It is obtainable in white-flowered and pink-flowered varieties as well as in blue. A mixed collection of the bulbs naturalized under fruit trees is a charming feature in any orchard.

Sisyrinchium.—These are often classed as bulbs although the root-stock is similar to that of a leek. They are very suitable for a rockery or for a garden where there is a light sandy peaty soil. The small pale-blue flowers produced in summer are on stems from 6–12 in. high. Increase by division of the root-stocks in early spring.

Sparaxis.—These like a well-drained sandy loam in warm sunny borders and should be planted in bold masses. They flower in spring and early summer, flowers being variously coloured white, purple, orange, red, etc., according to variety. They are scarcely hardy enough to grow in every situation, but where they can be grown with success they are well worth a position in the garden.

Tigridia (The Tiger Flower).—These are fairly hardy and in Southern gardens can be grown outdoors all the year round. Where there is any danger of frost entering the soil and damaging the roots it is better to lift them and store them in the same way as Dahlias, that is, in boxes of sawdust or sand. They can be readily increased by offsets or by seeds sown in spring in heat. The best species for the open garden is *Tigridia pavonia*, 1–2 ft. high, with flowers scarlet and purple and yellow. Other varieties are listed in trade catalogues.

Tritonia.—One of the parents of the Montbretia. Tritonias succeed well in rich, well-drained sandy soil. They are not perfectly hardy and should be grown beneath a south wall or in some similar sheltered position. They should not be allowed to become dry at the roots. Increase by separation of the corms or offsets.

Tulips ("Tulipa") Nat. Ord. Liliaceæ.—The tulips that we grow in our gardens are not natives of Britain but come to us from Turkey and are believed to have been of Persian origin. Tulips have for so long been favourites amongst horticultural specialists, and have been so intercrossed that the exact origin of any of the modern varieties is difficult to state. Efforts are, however, made to classify the different types for the purpose of identification and exhibition, and the chief classifications are as follows:

Single Early Tulips.—These are the first to flower and are the ones



1. *Deutzias* are some of the prettiest June-flowering shrubs. The flowers are either white or soft pink and the long sprays of bloom are useful for indoor decoration

2. *Broom or Cytisus*—red, brown and yellow summer-flowering shrubs

3. *Waterside trees and shrubs* by an informal pool

1. *Osmanthus Delavayi* has fragrant white flowers in May and effective glossy foliage



2. New Group Hybrids have been introduced which can be raised with fresh seed colours are terra-cotta, orange, crimson and pink.

3. *Philadelphus sybilie*, a charming variety of Mock Orange

The

1. *A stone edging makes a neat finish to a flower border flanking a gravel path*

Photo: Kodak



2. *A mixed flower border can be used to divide various parts of the garden.*



Photo: Suttons

3. *Tall herbaceous plants such as Delphiniums can be used very effectively in a border backed by an ivy-covered wall*



1. *Arneka Lupinus* stand up to 60cm in the mixed flower border. The colours include pink, yellow, blue and white and many are sweetly scented
2. *Perennial Lupinus* should be planted in bare areas, so that they can make a real splash of colour in the early summer



Perennial Lupins, Lupinus polyphyllus, in shades of pink, blue, and yellow

1



1. *Helleborus* or Christmas Rose should be planted in October or November to flower early the next year

2



2. Hips of some of the rose species are attractive during the winter months.

3



3. Mistletoe or *Viscum* can be grown by pressing ripe berries into the notched bark of an apple tree in March



Tall branching Larkspur in mixed colours make a fine display in the annual border



The modern Aquilegias are a great improvement on the old-fashioned Columbine More distinct colours and longer spurs are the main differences



1. *Scilla campanulata Excelsior* is one of the best of the Wood Hyacinths

2. The bright yellow *Crocus* should be mass-planted for a spring display

3. *Lily of the Valley* is very delightful grown as a pot plant

4. *Meadow Fritillaries* are easily naturalized in grass Their nodding, chequered and silver bells tremble in every breeze



1. *Narcissus Madonna de Groot* has a pure white perianth with a soft amber trumpet
2. Double Jonquils should be grown for their fragrance
3. The Poet's Narcissus have a bright orange eye which forms a pleasing contrast with the white perianth
4. *Dagdil White Lady* is strictly double and can be used for naturalizing and belongs to the *Leedsii* division of *Narcissus* Photo: C. Ingrey

1. *An archway at the commencement of a garden path forms a frame for the garden picture*

2. *Formal beds in grass are effective planted with Tulips—one variety to a bed*



Photo : Carters

3. *The brilliant colours of mixed Polyanthus show up well against the stone of a formal sunk garden*



1. *Lilium Regale* is one of the best to grow in the garden. The outside of the bloom is pink shading to white, and the inside yellow shading to white

2. *Lilium tigrinum*, the tiger lily, has orange-red flowers spotted purple



3. *Lilium umbellatum* is one of the earliest of lilies to bloom. There are yellow, red, and orange varieties

4. *Lilium longiflorum* is pure white and resembles the Easter lily of the florists

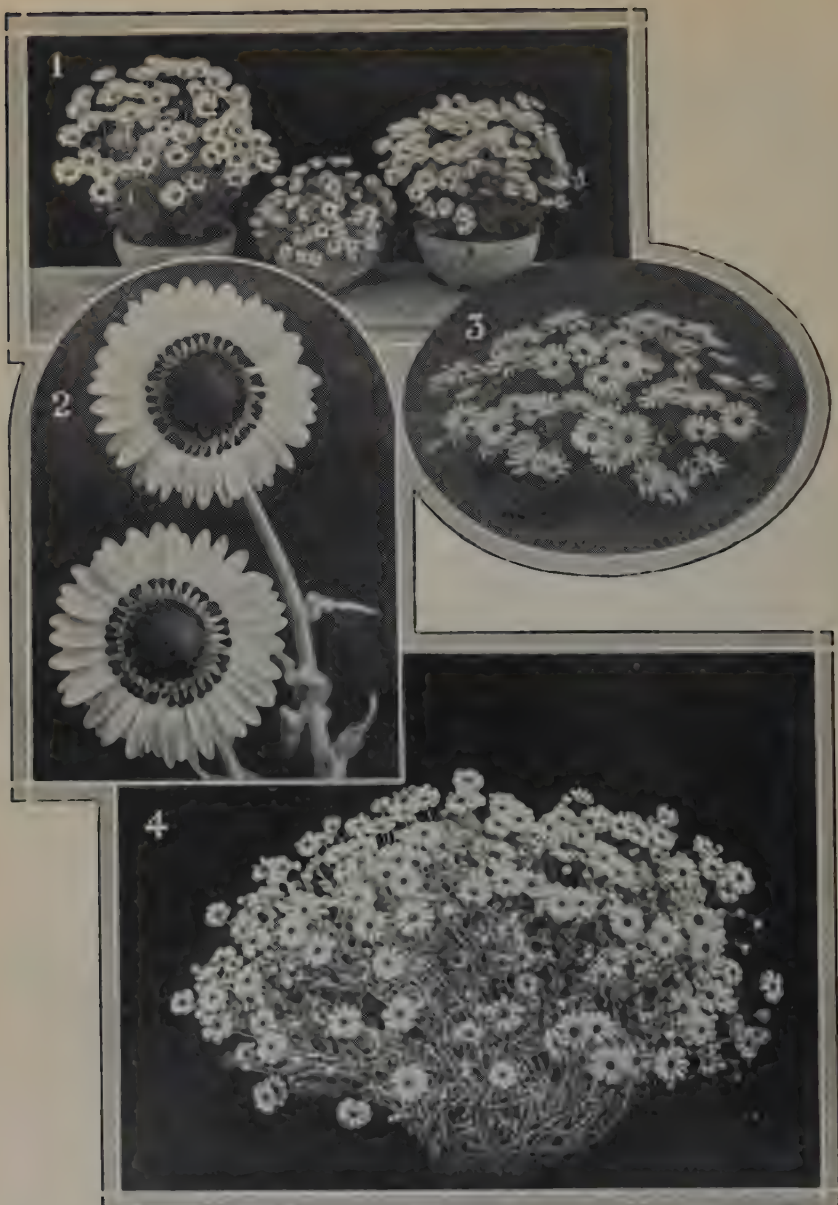
Photo: W. X. Unwin

1. *Helichrysums* are easily-grown everlasting flowers, effective in the flower border and useful for indoor decoration during winter

2. The berries of *Crataegus* varieties add colour to the garden in autumn



3. *Cortaderia* or Pampas Grass is ideal as a specimen plant in the garden and the silvery plumes can also be cut for indoor decoration



1. South African annuals make a bright display in a sunny corner of the garden

These are *Ursinias*—*anethoides*, *pygmaea* and *pulchra*

2. *Venidium fastuosum* has golden flowers with a maroon-coloured disc

3. *Gonolobus*—*Star of the Veldt*, will bloom within six weeks of sowing, in April

4. *Brachycome* or Swan River Daisy is a useful annual growing nine inches high

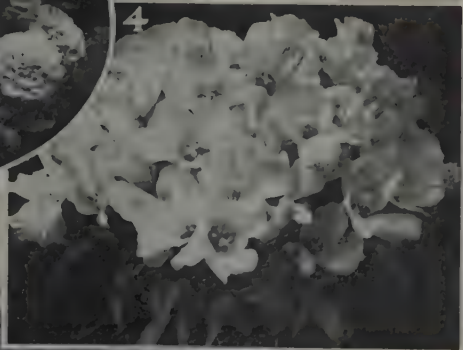
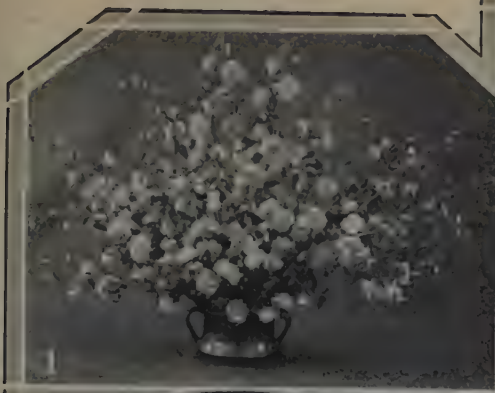


Photo: Suttons

5. Double annual borders flanking a grass path

1. *Clarkia May Blossom* is a useful annual both for the border and cut flowers

2. *Potentilla Warrensii* grows two feet high and has bright yellow flowers

3. A dwarf French Marigold, *Golden Ball* has double flowers, and is ideal for bedding as it grows only twelve inches high

4. *Godetia Wild Rose* is another fine bedding annual. It grows only ten inches high and is pale rose with a touch of carmine



1. *Verbena Rose Queen* has delicate rose-coloured flowers and makes a charming bedding plant
2. *Ageratum Little Blue Star* is a good compact variety useful for edgings or pots

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most used for formal bedding schemes. These tulips are also the best for forcing into early flowers for decoration at Christmas time and in early January. One of the best-known varieties is *Keizerskroon*, the common scarlet and yellow tulip.

Double Early Tulips.—Because of their double habit these are even more lasting as bedding flowers than the single varieties. But, though the flowers last longer, they are actually not so beautiful, and the majority of them are not so brilliant in colour, as the singles. The best-known variety of this type is *Murillo*, a pinkish white double tulip.

Cottage Tulips, sometimes called *May Flowering Tulips*.—These are more showy than the early singles on account of their tall stems. These again can be obtained in double or single varieties.

The Darwin Tulips are the most popular of all. The stems are from 24–30 in. high and the flowers are globe-shaped, with rounded petals, and rather substantial in appearance. Amongst them are found tulips of almost every colour, except a clear yellow.

The Rembrandt Tulips are exactly similar to Darwins except that the colours have “broken,” that is to say, instead of being of one colour the flowers are sometimes “feathered” or “flamed.”

Breeder Tulips are similar to Darwins, being also tall and substantial and mostly self-coloured. They are generally sweetly scented, and for the most part are of bronze, purple or buff colouring. The “Bizarre” and “Bybloemens” are the “broken” forms of Breeder tulips, with “feathered” or “flamed” petals. Lily-flowered tulips are the result of a cross between *Tulipa retroflexa* and the Darwin tulip. The shape of the flower is particularly charming.

Parrot Tulips have the rather curious and fantastic flowers with large untidy petals broken or fringed at the edge. Until recently, they have been inclined to be dwarf, and to have rather weak stems, but this fault is being overcome by hybridists. As the flowers are particularly showy and brilliant there is probably a big future of popularity in front of this race.

Bunch-flowered Tulips, also appear in modern catalogues. Some of the wild species of tulips habitually have two or three flowers on a stem instead of the single flower head which is most common, and the new bunch-flowered varieties have been obtained by crossing with these species.

Cultivation

INDOORS.—Tulips are some of the most easily cultivated of the spring bulbs in the garden, they are less easy to cultivate indoors, but only because they are rather exacting in the matter of watering and heating. They do not like a check to their growth through overwatering

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or underwatering or from sudden changes of temperature at any period and as it is difficult to maintain a very even temperature in an ordinary living-room, failures are frequent when tulips are cultivated by the novice. If, however, the amateur gardener wishes to grow them for home decoration he can do so quite satisfactorily in one of two ways.

He can either grow the tulips in deep boxes of soil under glass (in a cold frame if he has no greenhouse) until the flowers are just beginning to turn colour, and then carefully pot them up in ornamental pots or bowls for indoor decoration. Or if he prefers he can grow them in exactly the same way as Hyacinths and Daffodils in soil or fibre, but keep the bowls or pots in an unheated room throughout as in the case of growing Crocus and Scillas. Either method will avoid the alternating heat and cold of the living-room.

Tulips in the Garden

For outdoor culture Tulips are grown in ordinary garden soil, not freshly manured, but reasonably well supplied with plant food. Soil which has been manured for the previous crop, for instance, where Dahlias have been grown during the summer, is ideal. If there is any doubt about the fertility of the soil it can be deeply dug, mixing in bone-meal at the rate of 4 oz. per square yard. A dressing of lime over the surface should be given before any planting is done. The gardener's method of adding 1 in. depth of sand over the surface of formal beds before planting bulbs, is specially useful in the case of tulips, who do like to have the base of each bulb resting on sand.

Planting should be done with a trowel, and novices will do well to err on the side of deep planting rather than shallow planting. Tulips are planted rather late in the year to discourage them from sending up leaves before the worst of the frosts are over. Foliage appearing too soon is liable to be damaged and sometimes the effect of the plants is completely ruined.

None of the tulips need any support although certain of the Parrot Tulips are inclined to bend their stems and therefore look untidy. These should, therefore, be grown in rather informal parts of the garden, such as pockets in the rockery (or in hanging baskets in the greenhouse). All the other classes of tulips hold their heads erect without any artificial support. Nothing is better for formal planting than a mass of tulips because if varieties are chosen with care they present a perfectly even appearance, all growing the same height, and flowering at the same time. If tulips are used alone in the beds, they should be set out about 4 in. deep, that is, with 4 in. of soil (over the bulb) and 6 in. apart. A good mulch of well-decayed manure all over the surface of the bed, after planting, shelters the young growing tops.

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After flowering, tulips must be allowed to die down naturally if they are to replenish the store of food in the bulbs for another season's display. If it is impossible to leave them where they have been grown during the spring, as in the case of small geometrical beds, the tulips can be lifted and transplanted to some other part of the garden. In any case the tulips should be lifted out of the soil, and dried and cleaned, as soon as the foliage has completely finished its season of growth and turned yellow. Do not leave them to bake in too bright sunshine, but let them lie on the surface of the soil for about an hour or two after lifting, then rub off the soil and store the bulbs away in clean dry sand until they are wanted for replanting. The reason why lifting tulips is so important, is because otherwise they begin to grow too early in the season, and their foliage then becomes damaged by winter frosts. A few, however, such as some of the Darwins and the late Cottage Tulips, do not seem to mind if they are left to grow on year after year in the same position.

Like the Daffodils, Tulips in bedding schemes are really best associated with some sort of dwarf herbaceous plants such as Forget-me-nots, Polyanthus, Arabis, Aubrietia, or Alyssum. Designs of suitable bedding schemes can be worked out employing Tulips of various colours in this way. A list giving suggested spring bedding schemes at the end of this Chapter will indicate the lines on which these schemes should be built. In some cases it is better to use only Tulips in the bedding scheme, and the following are some useful suggestions for the planting of beds and long borders with single colours, two colours or more colours, as convenient.

Early Tulips

"Duc van Tholl" (various colours)	"Keizerskroon" (red with yellow margin)
"Artus" (scarlet)	"Pink Beauty" (rose)
"Chrysolora" (yellow)	"President Lincoln" (heliotrope)
"Cottage Boy" (yellow and orange)	"Rose luisante" (rose and white)
"General De Wet" (orange)	"Wouwerman" (purple violet)

Two-Colour Planting Schemes

- "Fred Moore" (bronze) and "Yellow Prince."
- "Wouwerman" (purple violet) and "Mon Tresor" (yellow).
- "Artus" (red) and "Chrysolora" (yellow).
- "Cerise Gris-de-lin" (mauve rose) and "Yellow Prince."

Double Early Tulips

- "Boule de Neige," white.
- "Imperator rubrorum," scarlet.
- "Electra," bright carmine red.
- "Mr. van der Hoeff," bright yellow.

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Two- or Three-Colour Planting Schemes

"Murillo" (pale rose) and "Schoonoord" (white).

"Lac van Haarlem" (purple) and "Schoonoord" (white).

"Vuurbaak" (orange scarlet) and "Schoonoord" (white).

"Electra" (carmine), "Mr. vander Hoeft" (yellow), and "Schoonoord" (white).

"Imperator rubrum" (scarlet), "Vuurbaak" (orange scarlet), and "Oranje Nassau."

Darwin Tulips

"Bartigon" (geranium red).

"Rev. Ewbank" (mauve).

"La Tulipe Noire" (black).

"Clara Butt" (salmon).

"La candeur" (cream).

"Scarlet Beauty."

Dutch Breeder Tulips

"Golden Bronze."

"Louis XIV" (metal blue with deep bronze).

"Chestnut" (brownish black). "Wilberforce" (apricot).

"Dom Pedro" (coffee brown). "St. James" (old rose with bronze edges)

Cottage Tulips

"Bouton d'Or" (golden yellow).

"Mrs. Moon" (golden yellow).

"Carrara" (pure white).

"Orange King" (bright orange).

"John Ruskin" (salmon).

"Sir Harry" (mauve rose).

Lily Flowered Tulips

"Sirene" (glorious satin pink).

"Alaska" (golden yellow).

"Adonis" (vivid pink).

"Artemis" (bright carmine rose).

Triumph Tulips

"Aviateur" (carmine red,
feathered white).

"Mr. Zimmermann" (fuchsia red).

"Lord Carnavon" (pink).

"Sagittarius" (white with creamy
rose border).

"Missouri" (rose).

"Ursa Minor" (deep yellow).

Best Varieties for Forcing

"Enchantress" (pink).

"King of the Yellows."

"Duc van Thol" (scarlet).

"King of the Scarlets."

"Fred Moore" (terra-cotta).

"La Reine" (white, tipped rose).

Of recent years the cultivation of tulip species has become very popular. Quite a number of different species are now listed in ordinary tulip catalogues and still more are grown by tulip "fans." Seeds are saved and crossed and the newer hybrids being raised offer interesting possibilities for the future. Some of the tulip species are not only

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extremely decorative but have an added grace and charm which is missing from some of the modern hybrids which were raised to please the florist. Some of the species most worth cultivating are as follows:

T. clusiana, inner petals white, outer carmine.

T. Greigi, vermilion-scarlet, yellow centre.

T. Kaufmanniana, reflex petals creamy white, carmine red outside, yellow centre.

T. persica, inside yellow, outside bronze.

In many cases these Tulip species are better left *in situ* and not lifted each year. A warm, sandy pocket in the rock garden is frequently the best possible position.

BULB PLANTING TABLE FOR THE COMMON OUTDOOR BULBS

	Best Month to plant	Depth of Top of Bulb below Surface Inches	Distance Apart Inches
Allium	October	2-4	4-8
Amaryllis	October	5	8
Anemone fulgens	October	2	4
„ (St. Brigid)	October	2	5
Chionodoxa	August	3	3
Colchicum	August	6	3-6
Crocus	August	3	3
Cyclamen	September	3	3
Eranthis	August	2-3	3-4
Fritillaria (Crown Imperial)	August	4	4-9
Fritillaria (Snake's Head) .	August	3	3
Galanthus (Snowdrop) . . .	August	3-4	3
Galtonia	March	4	9
Gladiolus	April	4	9
Hyacinths	October	4	8
Iris, English	September	5	4-6
„ Dutch	October	5	4-6
„ Spanish	October	4	4
„ reticulata	September	4	3
Ixia	October	3	4
Leucojum	August	3	4
Lily-of-the-Valley	November	2	4
Lilium auratum	October	6-8	12
„ Henryi	October	6-8	12

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BULB PLANTING TABLE FOR THE COMMON OUTDOOR BULBS—*cont.*

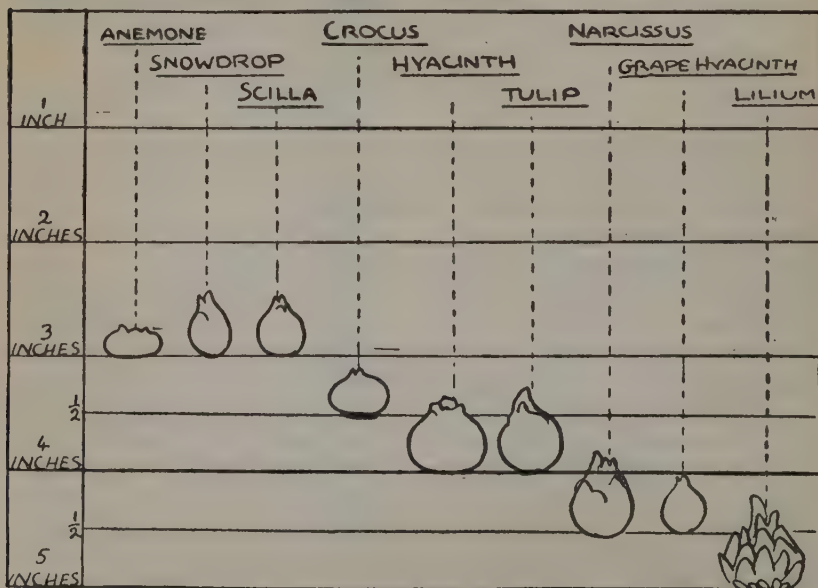
	Best Month to plant	Depth of Top of Bulb below Surface Inches	Distance Apart Inches
<i>Lilium speciosum</i>	October	6-8	12
„ <i>paradalinum</i>	October	4	12
„ <i>tigrinum</i>	October	8	12
<i>Muscari</i>	October	3	3
„ <i>dwarf</i>	September	4	4
<i>Narcissus</i>	September	6	6
<i>Scilla sibirica</i>	August	3	3
Tulips, long-stemmed	November	4-5	6
„ short-stemmed	November	4-5	6

SUGGESTED COLOUR SCHEMES FOR SPRING BEDDING (to include Bulbs)

“Gold Dust,” *Alyssum saxatile*, with Wallflowers (dwarf blood-red) and “Keizerskroon” Tulips.

“Royal Blue” Forget-me-nots with Tulip (Cottage) “Bouton d’Or” (yellow).

DEPTHS AT WHICH TO PLANT BULBS



As a rough guide, plant bulbs slightly deeper than double their own height; more deeply in sandy soils

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"Double White Arabis"—with Darwin Tulip, "William Pitt" (scarlet).

Cheiranthus allioni.—(Orange) with "Royal Blue" Forget-me-nots, and mixed "Breeder" tulips.

Hyacinth "City of Haarlem."—(Yellow) with single Arabis (white).

Hyacinth "King of the Blues."—(Dark blue) yellow Primula polyanthus.

Hyacinth "La Grandesse."—(White) with Primula polyanthus (red).

Iris, Dutch.—(Mixed) with Violas (blue, yellow and white).

Iris, Spanish.—(Mixed) with Violas "Yellow Prince."

Narcissus "Golden Spur."—(Golden-yellow) with Scilla sibirica (blue).

Narcissus "Horace."—(White and orange-red) with Wallflower "Miss Willmott."

Narcissus "King Alfred."—(Yellow) with "Royal Blue" Forget-me-nots.

Primula polyanthus.—(Red) with Viola "White Swan," and Narcissus poetas (white).

Tulip Artus (early scarlet).—With single Arabis (white).

Tulip "Keizerskroon" (early).—(Scarlet-yellow) with Arabis albida (white).

Tulip "Early double Schoonoord."—(White) with Chionodoxa (blue).

Tulip "Early Double Tea Rose."—(Primrose) with "Royal Blue" Forget-me-nots.

Tulip (Darwin) "Bartigon."—(Carmine-red) with Wallflower "Ivory white."

Tulip (Darwin) "Clara Butt."—With double white Arabis.

Tulip (Darwin) mixed colours.—With Iberis sempervirens (white).

Tulip (Breeder) "Bacchus."—(Royal Purple) with Wallflower "Golden Monarch."

Tulip (Breeder) "Panorama."—(Chestnut-red) with Wallflower "Orange Bedder."

Tulip (Cottage) "Bouton d'Or."—(Golden) with Aubrietia (purple).

Tulip (Cottage) "Ellen Willmott"—(Primrose) with Aubrietia "Dr. Miles" (purple).

Viola "Jersey Gem."—(Purple) with Tulip (Cottage) "Inglescombe Yellow."

Wallflower "Vulcan."—(Crimson) with Tulip (Cottage) "Bouton d'Or."

COMMON NAMES OF BULBS

Belladonna Lily
Butterfly Flower

Amaryllis.
Cyclamen.

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COMMON NAMES OF BULBS—*continued*

Caffre Lily	Schizostylis.
Cape Hyacinth	Galtonia.
Daffodil, Jonquil, Pheasant's Eye	Narcissus.
Dog's Tooth Violet	Erythronium.
Fritillary	Fritillaria.
Glory of the Snow	Chionodoxa.
Grape Hyacinth	Muscari.
Hyacinth	Hyacinthus.
Lily	Lilium.
Mariposa Lily	Calochortus.
Meadow Saffron	Colchicum.
Ornamental Onion	Allium.
Snowdrop	Galanthus.
Snowflake	Leucojum.
Star of Bethlehem	Ornithogalum.
Sword Lily	Gladiolus.
Tiger Flower	Tigridia.
Winter Aconite	Eranthis.

CHAPTER VI

CULTIVATION OF FLOWERS POPULAR ENOUGH TO HAVE A SPECIAL SOCIETY OF ENTHUSIASTIC GROWERS, WITH NOTES ON EXHIBITION CULTURE:—CACTI AND SUCCULENTS; CARNATIONS; CHRYSANTHEMUMS; DAHLIAS; DELPHINIUMS; FERNS; GLADIOLI; IRISES; PRIMULAS; RHODODENDRONS; SWEET PEAS; VIOLAS

CACTI AND SUCCULENTS

THE Cactus family (Cactaceæ) is probably better known for its peculiarities than for the undeniable beauty of its flowers.

A native of the American Continent, it develops in the desert lands of that great country to giant stature and grotesque shapes. In its effort to conserve what meagre water supply it can secure, it has turned its leaves into spines, reduced its branches to mere uprights, which offer small surface to the rays of the midday sun; it has cultivated "the hide of a rhinoceros"; in some cases covered itself with minute woolly hairs, and in every imaginable way reduced evaporation to a minimum.

Cacti grow throughout the continent of America, from Canada to Patagonia, so it is not surprising to find that there are over 3,000 varieties, and the plants vary in size from 60 ft. high to tiny buttons embedded in the soil.

They are, too, of innumerable shapes, globular lobed, angular, twisted, ridged, barrel-shaped, columnar or awl-shaped. They are only constant in the matter of colour—in which their taste is a somewhat monotonous greyish green—though one or two let themselves go in the coloration of their spines, and vivid flowers are frequent among them. Actually an odd variety here and there indulges in markings of yellow, but the Cactus has so reduced its surface to prevent loss of water, that it is usually bound to keep that surface entirely green to provide sufficient chlorophyll with which to carry on its vital processes.

The amateur often asks: "What exactly is a Cactus?" And it is not enough to say "a succulent plant," for there are quite a number of succulent plants that are not Cacti, although every Cactus *is* a succulent plant. The Cactus is perennial, its fruit is a one-celled berry, its seed has two cotyledons, and its ovary is below its petals. But its last and most essential characteristic is that it has areoles, that is, spine cushions

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from which spines may or may not grow. Given these characteristics, the succulent plant is a Cactus; without them it is merely a succulent plant.

It may be well to note, too, that there are exceptional economic values in these plants. Immense plantations of Cacti (*Opuntias*) have been maintained for the growth of cochineal insects, for cochineal dye.

The liquid contents of some varieties are valuable in the treatment of various diseases—particularly diseases of the eye. The young shoots of some are eaten raw as salads, or cooked as vegetables, and the centre pulp is made into candy.

Orchards of Cacti are grown for the sake of their fruits, which are considered great delicacies in Mexico. The spines are used as toothpicks and for other purposes where a sharp, strong point is needed. Fences, and even huts, are made from their wood; they are excellent hedge plants, and travellers in the deserts, well-nigh dying of thirst, have been saved by the discovery of a barrel Cactus with its moist pulp.

In England, small Cacti are grown in pots, and kept in warm rooms or greenhouses, and a visit to Kew or some other large botanical garden is the best introduction to the possibilities of the family. Interest in Cactus culture is growing, and those who are taking up this hobby will find many kindred spirits.

Classification.—The simple Continental classification (rather than the more elaborate, new American nomenclature) divides the main families into:—*Cereus*, *Echinocactus*, *Echinocereus*, *Echinopsis*, *Mamillaria*, *Opuntia*, *Rhipsalis*, and there are a number of smaller classes, among which are the slightly differing *Epiphyllums* and *Phyllocacti*, whose fleshy, flattened stems are leaf-like in form and bear flowers on their tips, or along their edges.

To the *Cereus* family, which may be columnar, or trailing in habit, and is ridged, belongs the world-famous "Queen of the Night," whose flower opens after dusk and dies before morning.

Echinocactus, usually round, include the immense Barrel Cactus of which mention has already been made.

The most familiar of the *Opuntias* are the Prickly Pear, which has become such a pest since its introduction into Australia, and *Burbank's Perfection*, the new spineless Cactus, which forms invaluable cattle food in Mexico.

Culture.—As is usual, the Cacti favour similar conditions to those of their native haunts, and, from a list compiled by an American grower, it seems that the great majority have a penchant for full sunlight, and sand; a moderate number do better with some humus and medium sunshine. A few prefer lime and a certain amount of shade, and a crank

CACTI AND SUCCULENTS

in the family here and there will only thrive on chalk! But the two things that must be avoided in this country are excess of moisture and frost.

A sunny window or warm greenhouse are essentials, as a temperature of 60–70° is needed to keep the Cactus healthy.

To prepare for potting.—Thoroughly wash and scrub out all pots to be used; disinfectant in the water will ensure destruction of any harmful disease spores, but if used it must be rinsed away with clear water before the pots are used.

Fill one quarter of the pot with clean, broken crocks. Mix two parts of garden soil, *without humus or manure*, with one part of silver sand. (It is best to *burn* the ordinary garden soil before use.) Do not powder the soil, but let it remain somewhat lumpy, and put some in over the crocks before putting in the plant. Mix in a little builder's rubble in small lumps like peas and if the soil is not sufficiently good, add a little bonemeal, but on no account use manure.

Potting.—Suspend the plant in the centre of the pot and trickle the soil in round it. Gently press the soil, but do not ram it.

Watering.—Golden rules for watering are: When in doubt, do not water at all. Increase water when new growth appears. Warm the water slightly in really cold weather. Never water from the top, stand the pots in water until moist, then drain. If the top soil is already dark and damp do not water.

At times give salt in the water used. One dessertspoonful to a gallon is sufficient.

At the end of August lessen the water supply. During September and October, once a week will suffice; during November, December and January, once a fortnight; February once a week; March thrice a week, and from April to August normal daily watering. *Mamillarias* will, however, need more water from February as they flower by the end of March.

Most Cacti love sun and fresh air—so, on all except frosty days, open the windows or ventilators during the day—but shut them well before sundown.

Flowers are the glory of Cacti, and while some, like the *Mamillarias*, bear small flowers in profusion, others like *Echinopsis* and *Cereus* have huge flowers, as much as a foot in diameter, and many of the smaller Cacti are almost hidden in flowering time by their blooms, each larger than the plant itself.

Propagation.—*Grafting.*—Americans have adopted a method of propagating weak-rooted plants, by means of grafting the top of the Cactus on to a strongly-growing member of the same family. In the case of thin-stemmed specimens it is done by cutting a wedge-shaped section into

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the stalk of the strong-growing Cactus, and inserting a wedge cut from the weak one. The two are pinned together with two Cactus spines. In the case of a thick Cactus, a flat top or scion is cut off the weak one, and a corresponding flat surface cut on the strong—the two, scion and stock, are joined with the least possible delay and tied together with strings previously fixed round the lower Cactus. A flat disk of cork on the top keeps the strings from cutting the Cactus. The results are to promote a rapid, vigorous and healthy growth in the weaker plant, and to induce earlier flowering. This must be done in the hottest season when both are growing fast. In England, propagation is usually carried on either by cuttings, or by seeds.

Cuttings.—First examine the Cactus, and remove all dust or debris. Carve out any holes or depressed spots. Cut with a clean sweep, using a very sharp knife—a sawing action is detrimental. Dip the cut surface in fine charcoal, or merely put the cutting on a dry shelf for 24 hours, and a skin will form over the cut portion. Plant in clean, dry, *sandy* soil. Be very careful not to break the skin over the wound or rot will commence. Do not water for a fortnight, and then when the plant picks up, repot in the usual soil. Alternatively leave the cutting on the dry shelf, and in most cases roots will form in a fortnight or three weeks. *Epiphyllums* often root in one week, but there are desert plants that take three years! A Cactus plant may be cut up into pieces, and thus treated, each piece will root and grow. Very small cuttings may be pegged down on to sphagnum moss, with a hairpin, till they make roots.

Seeds.—These are cheap, plentiful, and by far the most interesting method of propagation. Many Cacti produce seeds which start to germinate on the parent plant, and if the seed is collected from the old flower stem when it has ripened and is sown at once, it grows quickly. If left till the next spring it is very erratic in the time it takes, this being anything from three days to a year. Sow as early in the year as possible so that young plants may be well established before winter. Use much more sand than for adult plants. Avoid caking the soil. Drain well. Do not cover the seed with soil, but just press it in lightly. Water from below. Cover the pots with glass; until the seedlings start to grow the atmosphere must be kept close and moist.

When the new plants can be seen, lift the glass very slightly at first to let in a little air, but do not hurry, as the "slow" seeds need time to root. Let in more air by degrees, and when warm weather comes remove the glass entirely.

Transplanting.—A piece of wood notched into a V which can be inserted into the sand by the side of the seedling, will lift it with a trifle of its own soil and prevent breakage of the tender roots. The new soil should be just a little more sandy than usual with adult plants, and will

CACTI AND SUCCULENTS

last for one or two seasons, when a further transplanting into normal soil will be required.

Diseases and Pests.—Cacti are subject to few diseases. The worst is Rot. This is due to stagnant or dripping water or to some neglected wound.

First correct the cause by improving the soil or drainage, then with a sharp knife cut out the rotted portion. The healthy tissue will skin over and heal.

Another disease—rare, fortunately, in England—is “Orange Spot.” There is no known cure, and unless the plant attacked is at once destroyed, the disease may spread through a whole collection.

Pests are not numerous; the thick skin is a deterrent. Mealy Bug is the most common. This is a grey, fluffy insect, oval in shape with many legs. It likes to dig into the areolæ and spine clusters, and its position is betrayed by a spot of white fluff—which is almost certain to be bug and eggs.

The better, though more tedious, way to deal with it, is to pick off the insects with a pin, taking care not to prick the plant. Alternatively paraffin can be used, but it may result in the death of the plant too. The safest method is to use one-third of an eggcupful of paraffin to a pail of water, well swished round. If the paraffin is allowed to clot together it clogs the pores of the plant, so it must be kept well agitated. Into this dip the plant bodily for a few seconds, and then plunge it into clean water to remove all traces of paraffin.

A white insect which burrows into the roots is best dealt with by cutting off the affected roots and burning them. The plant is left on a dry, warm shelf to heal, then the soil is changed and the plant repotted.

The following plants can be recommended as easy growers, of beautiful appearance or producing showy flowers:

Cereus	azureus.	Azure-blue.
„	flagelliformis.	Pink.
„	Macdonaldii.	Yellow and white.
„	grandiflora.	Yellow and white.
Echinocactus	electracanthus	. Yellow.
„	gibbosus	. . White.
„	ingens	. . Yellow or pink.
„	setispinus	. . Yellow and red.
Echinocereus	de Lactri	. . Rose.
„	pentalophus	. . Rose and white.
Epiphyllum	Gærtneri	. . Orange and scarlet.
„	Russellianum	. . Rose.
Mamillaria	candida	. . White.
	crucigera	. . Purple.

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Mamillaria	longimanna	. Yellow.
"	microhelia .	. Yellow and violet.
"	rhodantha	. Red.
Opuntia	Basilaris .	. Rose-purple.
"	rhodantha	. Red.
"	salmiana .	. Yellow.
Phyllocactus	Ackermannii	. Rich crimson.
"	crenatus .	. Cream or orange.
"	grandis .	. Creamy-white.
		(Night flowering.)
Rhipsalis	gibberula	. White.
	mesembrianthe-	
	moides	. White.
"	paradoxa .	. Yellow.
"	penduliflora .	. Greenish-yellow.

Other Succulent Plants.—Of the succulents, outside the Cactus family the larger number belong to the Order Crassulacæ, and are well known as roof, wall, greenhouse or small bedding plants.

Cotyledons include now the *Echeverias*, familiar as the little formal bedding rosettes, with their arched red stems and dropping yellow flowers.

Cotyledon chrysantha, the golden-flowered House-leek Pennywort and *Cotyledon simplicifolia* with arched stems and yellow flowers and free-running habit, are plants best suited to the rock garden. For the greenhouse *C. fulgens* in summer, *C. glauca* and *C. retusa* in autumn, and *C. coccinea* right on into October, will light up their scarlet, yellow, and crimson lamps.

Crassula sarcocaulis is another fleshy-stemmed greenhouse plant, with purple flowers. *Three-inch* cuttings are taken in summer from the tops of shoots that have not flowered.

They are left exposed to the air for a few days, then potted singly in small pots. When, about the end of October, the pots are full of roots, they can stand on the greenhouse shelf for the winter and are given very little water.

In spring, the growths should be stopped 3 or 4 in. away from the pot and a few of the top leaves taken off. New shoots will form. These must be thinned to 2 or 3 according to the strength of the plant. When the shoots are 2 in. long each plant is moved into a larger pot filled with loam and broken brick and set in the greenhouse. At the end of June they should be plunged out of doors in sand in the shelter of the greenhouse, the sand being watered occasionally. Moved to a cold pit on the approach of frost, they will be ready for bedding out in the following May.

CACTI AND SUCCULENTS

If flowers are wanted annually, only one shoot must be allowed to bloom.

Sedum, Stonecrop (Crassulaceæ).—The common stonecrop—"sitting on the wall" with its knobby stem and yellow stars, is a very familiar sight in country districts. There are many hardy varieties, and also a few tropical ones, which need greenhouse treatment. Annuals are propagated by seeds, often self-sown, on dry places such as banks and walls; perennials by cutting or divisions, planted in dry, sandy loam mingled with a little brick rubbish.

Greenhouse varieties need a dry life in winter, but are easy to grow.

Sempervivum, House-leek (Crassulaceæ), is common on old cottage roofs, and easily recognized by its loose rosettes of greyish leaves and purple flowers. The yellow-flowered *S. glaucum* tinges the edges of its leaves with purple, but the Cobweb House-leek, *S. arachnoidium*, sends up red flowers above its "cobweb" covered leaves. (If grown in full shade, the cobwebs do not always develop.)

Their place in a garden is any dry and sandy spot where a little lime can be found, and where other plants would fail for lack of water, such as old wall crevices or the dry upper pockets of a rockery. Greenhouse kinds are propagated by cuttings which are better dried in the air for several days before planting. Use potting soil as for Sedums.

In many other Orders there are odd species which have adopted a succulent habit. Among such, the more notable are:

The American Agave (Amaryllidaceæ) with its "shuttlecock" arrangement of thick fleshy leaves from the centre of which springs at infrequent intervals a tall spike of creamy flowers, rising 10 or 15 ft. in the air.

Mesembryanthemum, Ice-plant (Ficoideæ).—This is a native of South Africa.

M. crystallinum, a half-hardy succulent annual, has leaves and stems covered with glistening grains which give the appearance of a coating of ice. It is a pretty plant for a dry rockery, and sown in the greenhouse in March, it is ready to plant out in June.

Othonna crassifolia is one of the Compositæ. It is a pendent-basket plant of the Ragwort type but succulent. The perennial is a greenhouse evergreen, with yellow flowers and thickened leaves. It is propagated by division.

Stapelia cactiformis is an Asclepiad, which has thickened itself to cope with drought, as did the Cactus family. It is grown in greenhouses, but its flowers are of unpleasant odour, so it is not popular.

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CARNATIONS AND THEIR COUSINS

The *Dianthus* Genus

The Carnation family is of great antiquity. It came over with William the Conqueror, and traces its lineage back to the "Dios Anthos" or Divine Flower of the Golden Age of Greece. There can be no question that the Carnation is of the real Aristocracy of Flowerdom. There are still some members who can exist only in the warmth of the greenhouse, and we dare not suffer the winds of heaven to visit their heads too roughly!

In Elizabethan England, the Carnation (*Dianthus caryophyllus*) was known as the Coronation Flower and adorned the lover's chaplet.

The French Carnation, *Dianthus romontant*, was taken to the New World by the French settlers and there developed into the Tree Carnation of modern days. From South Africa, Australia and even Sweden, with its dark wintry days, accounts come of the success with which this cosmopolitan plant is being cultivated.

In England to-day it is computed that ten million plants of Perpetual-flowering Carnation are raised annually to supply the needs of florists; and private growers are legion.

Carnations, as a general term comprise:

The old BORDER CARNATION (*Dianthus caryophyllus*), the pride of our grandmothers' gardens, which flowers in July and August.

The SOUVENIR DE MALMAISON, which flowers in early summer, and is so difficult to rear that it has been largely superseded by the Perpetual-flowering Malmaison, itself delicate enough to require the heated greenhouse for its development—but otherwise cultivated on the lines of the Perpetual-flowering Carnation.

The PERPETUAL-FLOWERING CARNATION, a modern hybrid between the American Tree (*Dianthus romontant*) and the Old Border Carnation. Its flowering season is October to April, under glass, and all summer outdoors.

The MARGUERITE CARNATIONS, a group of fringed and fragrant hybrids obtained from a cross between *Dianthus Chinensis* (the Indian Pink) and an early-flowering species.

HARDY PERPETUAL BORDER CARNATIONS, a cross that perpetuates the hardiness of the old Border Carnation with the perpetual qualities of the greenhouse strain. Closely allied to these are the perennial *Allwoodii* (hybrids between the Perpetual Carnation and the hardy Border Pink), the biennial *Chinese Pink* (*Dianthus sinensis*), the *Sweet Wivelsfield*, a cross between Sweet William (*Dianthus barbatus*) and the *Allwoodii* Pinks.

Included in the genus *Dianthus* are the whole range of Garden Pinks,

CARNATIONS

Border Pinks (*Dianthus plumarius*), from which are derived the Laced Pinks, Sweet Williams, Rock Pinks, such as *Dianthus alpinus*, and Wild Pinks.

BORDER CARNATIONS, hardy and easy to cultivate, can be grown from seed, but as there is a strong tendency for seedlings to produce only single flowers, it is safer to increase stocks from layered shoots or from cuttings.

If seed is sown in the hope of obtaining novelties, the box should have a layer of leaves to hold the moisture, and on this a compost of fairly rich soil plus sharp sand and a good proportion of old mortar or lime.

The seed is scattered thinly, and covered with fine soil and a sheet of glass. Immediately after germination, the glass is taken off, as this group does better grown hardy. If seed is sown in February or March the plants may flower the same summer, but if later, they will not do so until the following year.

The more usual methods of propagation are by layers or cuttings.

Layering is the simplest of all methods of increasing Carnations of this type. It requires four or five inches of clear space round the plant, a 3-in.-deep layer of prepared soil (leaf-mould and road grit) on this space, and young side shoots four to five inches long, or longer.

Method:—(a) Strip a few pairs of leaves from the bottom of each side shoot so that foliage will not be under the soil when layering is finished. (b) Cut a slanting notch, upwards, two-thirds through the stem, and press this into and under the prepared soil in such a position that the notch is open. (c) Peg it firmly down with a carnation peg, forked twig, hairpin or some similar fixture, and press the soil firmly round it. (d) When all side shoots are thus treated, well water the whole set of layers.

In three or four weeks new shoots will form at the notch and the new plant can be severed from the parent, but six weeks at least should elapse before lifting. A July layer can be left till September before moving to its permanent home on the border. Only an exceptionally exposed garden will give cause for the use of a cold frame for protection, as, in spite of their ancient lineage and pride of race, Carnations, like tramps and gipsies, prefer "sleeping out."

The parent plant, having, like King Lear, given away its all, is as ruthlessly scrapped.

Cuttings. A more convenient method of increase, where the border is crowded and no space is available round the old plant, is by cuttings. In this case shoots are "pulled out at a joint," and inserted in sandy, well-limed, soil, either in a cold frame or in the open ground. Alternatively, the stem can be cut just below the joint, the lower leaves stripped off, and the stalk inserted as described.

Cultivation. The first essential is a fair proportion of lime in the soil. It can be obtained as old mortar rubble, slaked lime, or chalk.

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Wood-ashes and bone-meal are good additions for making vigorous plants, and as wireworms are the pests most inclined to attack carnations, a garden made on or near old meadow land is likely to need a soil fumigant.

PERPETUAL-FLOWERING CARNATIONS; though they will flourish in a border during a mild summer, are mainly greenhouse plants and are cultivated in large quantities both in England and America for autumn, winter and spring flowering.

In the "Land of the Dollar" the Carnation cult received tremendous impetus from the spectacular sale for 30,000 dollars of a special variety, "Mrs. Thos. W. Lawson," to the Copper King, after whose wife it was named.

But in spite of that, Carnations as decorations will probably never be as popular in America as in England, as they object to the central heating (so frequently central *over*-heating) of the American dwelling-house, and do not last well there.

CULTIVATION

The amateur usually buys a plant in a 3-in. pot, in spring. Till May it stands in an airy light spot in the greenhouse or cold frame. Later it occupies a sunny dry spot in a sheltered garden. When roots come through the bottom of the pot, it is repotted into a larger size, and left outdoors till August. It must then return to the greenhouse, on a staging above gravel, shingle or cinders, in a cool, light spot. Flowers appear regularly from September to the end of spring, provided that the greenhouse is always kept above freezing-point.

During the winter, side shoots will develop, and from these cuttings are taken to raise new plants. As new plants give the finer flowers, and are generally more shapely, it is recommended that cuttings should be taken each year, though the parent plant will flower for the summer in the open, or for the following winter if left in the greenhouse.

The cuttings should be chosen carefully, those near the base of the plant being usually best, though the lowest one is often badly formed. Discard any dwarfed, twisted or leggy shoots, and pull out each cutting at a joint or take it off with a heel, i.e. off the main stem with a downward pull.

Remove the lower leaves. Insert the cutting in clean, sharp sand, with a bottom temperature of 60°, and a top temperature of 50°; or use a close, frostproof, propagating frame without heat. Water sparingly after the first few days.

When well rooted, put the cuttings into 2-in. pots, and stand in the light, but away from draught in the greenhouse. In from four to six weeks they will need 3-in. pots, and the centre portion should then be

CARNATIONS

pinched out. Unless you want to put back your plants for winter flowering, let them grow on undisturbed, to flower in the border. If you require winter flowers only, stop the side shoots in June or July if they are too forward, by pinching out their centre also.

Disbudding is practised only for exhibition purposes, otherwise it can be dispensed with at will.

Soil. A heavy loam is best. For the first potting, add sharp sand or small brick rubble. For the second potting, add wood-ashes and burnt earth. For the final potting add to twelve parts of loam, not too finely chopped, three parts of old well-decayed cattle manure, one part ashes.

In addition, a 5-in. pot of bone-meal to each barrowload of soil is recommended. The soil should be well rammed in the pots, so that there are no air spaces.

MARGUERITE CARNATIONS and the CHABAUD STRAINS are perennials, but usually treated as annuals, and raised from seed. They contain all the varieties of colour known to Carnations and are equally good for border or conservatory. Those who do not yet know them should try them, if only for their value in the house vases.

Cultivation. Sow seeds in heat, in January. Prick out into boxes. Pot up into sixty-size pots, and in April into forty-eight size. Use good fibrous loam, enrich with well-rotted leaf-mould, add crushed mortar rubble, wood-ash and sharp sand. Pot firmly, and expect your flowers in June.

SWEET WILLIAMS are old friends, and well-known biennials. For them any ordinary soil and an outdoor life are sufficient. The seed is sown in late spring, and the seedlings are thinned or transplanted as soon as possible. The permanent quarters of Sweet Williams in the open border should be 12 in. apart, and they must take up their abode there in autumn to flower well the following summer.

CHINESE PINKS are grown from seed in the same way, as also are Sweet Wivelsfields.

PERENNIAL BORDER PINKS are propagated by seeds, cuttings, layering, and division, and though they are less finicky than many plants concerning soil conditions, they object to removal. They flourish best in a sunny sheltered spot, with plenty of lime in the soil, and an annual dressing of well-decayed manure.

Propagation. Seeds are sown in boxes in the open in April or May. Cuttings are struck in sandy soil in a frame in July. Layers are rooted in the same month, and both are ready to pot up in a compost of loam and well-rotted manure in September. Division of the plant is also done in September, in cases when the clumps have become spreading and bare in the centre, and the divided portions should be planted out at once in fresh soil.

COMPLETE GUIDE TO HOME GARDENS

Allwoodii are cultivated in a similar manner, but after planting the tops are pinched out to make the growth more bushy. They will flourish anywhere, except under dripping trees or in a sunless border. Should they be in a somewhat damp position, a top dressing of grit will prevent the moisture collecting round the collar of the plants. They are excellent plants for window-boxes, dry walls, hanging baskets, roof gardens and rockeries.

ROCK GARDEN SPECIES. All the species of *Dianthus* grown in rock gardens are more or less scented, and profuse in flowering. They are sun-loving plants, and require only the ordinary soil of the rock garden and a sunny pocket to flower profusely.

Propagation of these species is by seed, which is freely produced, or after flowering is over, by cuttings, which root readily in sand under a hand-light. They are ready for individual pots in a short time and form good flowering plants by next spring. Some of the best and easiest Rock species to cultivate are:

Dianthus alpinus.

Dianthus Allwoodii alpinus—obtained by crossing *Allwoodii* with *Dianthus alpinus* and other species and intercrossing the progeny. They are miniature plants, very useful in the rock garden.

Dianthus cæsius—the Cheddar Pink (from the rocky gorge in Somerset).

Dianthus deltoides—the Maiden Pink.

Dianthus graniticus—with small starry, speckled pink flowers, and trailing habit.

Diseases that attack this genus are mainly Carnation Rust and Red Spider. The *Rust* is spread by spores which may be blown for considerable distances, and it has seemed difficult to discover a complete cure or preventive. American opinion discounts the recommendation to spray with Bordeaux mixture, as after a short time the spraying appears to have little effect, and inclines to the attempt to produce immune varieties rather than to cure the sick.

The suggestion was made that a spraying with salt solution (eight 6-in. potfuls of common salt to fifty gallons of water), stirred from the bottom to equalize the strength, and used both from above and from below the foliage, would stop the attacks both of Rust and of Red Spider. Three or four days after this application, the plants must be syringed with clear water. Otherwise the foliage must be kept dry. The treatment must not be repeated oftener than once a fortnight.

English growers advocate, variously: burning all affected parts, brushing the leaves attacked with a solution of permanganate of potash, and smothering plant, pot and surrounding surface with old soot.

One grower considers he owes his freedom from Rust to the top-

CHRYSANTHEMUMS

dressings of old soot, one trowelful on each 8-in. pot, which he gives to his potted layers in May. The same grower applied the salt treatment given above *without the washing* and found it both effective and safe. A suggestion to dispose of all pests by high-tension electricity has yet to be tried.

The following are reliable varieties in each class for cultivation by the novice:

HARDY BORDER PLANTS

Old Crimson Clove, crimson.	Border Yellow, yellow.
Steerforth Clove, white and maroon.	Orangeman, orange apricot.
Peach Blossom, pink.	Raby Castle, salmon.
Grenadier, scarlet.	Snow Clove, white.

PERPETUAL-FLOWERING CARNATIONS

Dilys, yellow, with pink edge.	Red Laddie, red.
Wanda, dark red.	Rapture, salmon rose.
Achievement, apricot.	Wivelsfield Buttercup, yellow.
Arctic, white.	Wivelsfield Copper, copper
Laddie, light salmon pink.	bronze and orange.

HARDY PERPETUAL-FLOWERING CARNATIONS

Sussex Pink, pink.	Hawk, white, spotted crimson.
Sussex Brilliant, white and chocolate.	Sussex Rosalind, yellow, red.
Sussex Dawn, heliotrope, flaked cerise.	Highland Lassie, white, edged red.

PERPETUAL-FLOWERING MALMAISONS

Atlantic, white, flushed pink.	Hugh Low, baby pink.
Delicate, pale pink and rose.	Jessie Maize, deep maize.
Jessie Allwood, yellow.	Mrs. C. F. Rachael, cherry.

Chrysanthemums (Nat. Ord. Compositæ).—To the man in the street, the word *Chrysanthemum* means the lovely mass of coloured flowers he sees in the markets from September to November. These are to the gardener "Japanese Chrysanthemums" and to the botanists, more accurately, *Chrysanthemum sinense*, i.e. chrysanthemums from China, their country of origin.

The genus *Chrysanthemum* includes many different species, some of which are commonly known as Ox-Eye Daisy, Marguerite, Pyrethrum, Corn Marigold, Shasta Daisy, etc. The Japanese Chrysanthemum is the

national flower of Japan, and as such gives its name to their highest Order of Honour—"The Order of the Golden Flower." It was brought to England in 1746. Since then it has so gained in popularity that it is now one of the most important plants grown here for the market supply of cut flowers.

CULTIVATION OF THE JAPANESE CHRYSANTHEMUM

In the border, no flowers are more easily cultivated than the early-flowering varieties of the Japanese Chrysanthemum, if given from the outset their simple requirements. They like a fairly rich soil, light in character. This means that on clay soils good drainage must be provided by deep digging, and on both sandy and stiff soils plenty of decayed leaves, grass clippings, and other organic matter must be used.

Chrysanthemums are specially susceptible to sudden checks, and if allowed to dry, or be checked at any time by cold, or shortage of food supplies, the flowers will suffer. This is equally true of both early and late-flowering kinds.

In the early months of the year, cuttings are easily obtainable. These are grown on singly, in 3-in. pots in the cold frame, or greenhouse, and must be allowed to continue growth without any check. The plants to be grown in the open garden are stopped once, that is, the top of each growing plant is pinched out (usually about half a dozen leaf joints from the base), with the result that in a few weeks side shoots develop and make a bushy plant ready for planting out in May. The plants are not potted into large pots unless it is desired to use a few of the early border varieties for pot culture. The lights of the frame are removed altogether during mild weather, and only replaced at night when frosts are about.

The late-flowering varieties, grown in pots for winter blooming, are stopped about the same time as the others, and allowed to form three to six shoots. When the new growths are about an inch long, the plants are potted into 5-in. pots. These can stand in the frame, with ample space between the pots, until it is mild enough to move them into the open. They are then potted into 8- or 9-in. pots, and stood in rows out of doors, preferably on an ash foundation, so that a moist atmosphere prevails. Plants may be sprayed overhead, but not made too wet, or allowed to remain wet overnight. They should stand in full sunshine.

The best soil for the pots consists of three parts chopped turves, one part horse droppings (after they have been stored dry for several months so that they are well decayed), half a part leaf-mould, a little silver sand, and a little builders' lime and bone-meal. The pots are only filled to within two inches of the top at first, so that there is room for top dressings later.

Both pot plants and those in the border need staking, otherwise the

CHRYSANTHEMUMS

stems may break in high winds. Ordinary bamboo canes are best, choosing lengths according to the variety of the plant. Some chrysanthemums grow to as much as 5 ft. high, and should be staked accordingly. Raffia is best for tying, and about once a fortnight all the growing season fresh ties will be needed.

Weeds must be kept down—in the borders with a hoe, but in the pots hand weeding is necessary.

If the pot plants stand in rows 4 or 5 ft. apart it leaves ample room for watering and tying. A good way to support them while they are still in the open is to set two stakes in position one at each end of the row, with a wire stretched between, and to tie the cane of each pot to the wire. This prevents damage by high winds.

After they are in their final pots, they are fed with liquid manure once a week, and top dressed lightly at the end of July, the third week in August and again in September. The top dressing should be of soil made by mixing good loam, three parts, with one part each of well-decayed horse manure, and silver sand, together with some reliable chrysanthemum fertilizer, of which there are several makes on the market.

When flower buds begin to show, alternate weekly doses of liquid manure made from horse droppings, and soot water, may be given. Where animal manure is quite unobtainable, a good stimulant may be made by mixing together an ounce of nitrate of potash and an ounce of phosphate of potash in a gallon of water. This should be used in very small quantities, and only after soaking the soil thoroughly with water.

About the third week in September, the pot plants are brought under glass. It is best to spray them immediately with liver of sulphur, or to dust the foliage with flowers of sulphur, to prevent the appearance of mildew.

Plenty of light and air must be given, and the temperature never allowed to drop lower than 45°.

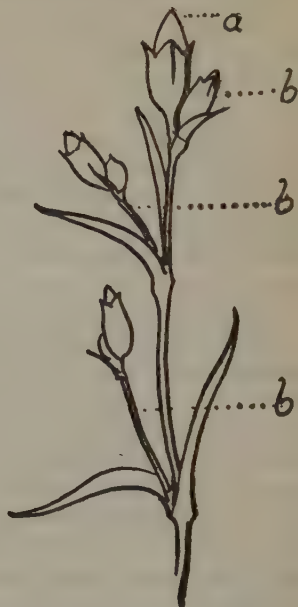
Stopping and Disbudding.—It is over the vexed question of stopping and disbudding that the amateur gardener usually finds most difficulty. To go fully into this matter would need a whole book, since almost every variety has its idiosyncrasies. What concerns the novice is the “securing” of what are called “first crown buds” and “second crown buds.” If he once understands this, he can follow easily enough the instructions that are usually given in the catalogues of the specialists.

“Stopping” is what has already been described, that is, taking out the central portion of a growing shoot. The effect of this is to make the plant grow side shoots, or, as growers would say, to make it “break.” When growers talk of “securing” buds it means that all flower buds, except the ones secured, are rubbed off. Sometimes it is the central flower bud on the main stem which is retained, while the others are rubbed off. This

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is called the "first crown" bud. Sometimes this bud is rubbed out in early stages. Similar central buds then develop on surrounding shoots, and each of these is called a "second crown" bud.

For ordinary garden decoration, and also for decorating varieties grown in pots, disbudding is not always practised, as the natural spray is preferred. For exhibition blooms however, it is always necessary.



DISBUDDING CHRYSANTHEMUMS ♂ CARNATIONS
BUDS MARKED *b* SHOULD BE REMOVED.

Disbudding is practised to produce large shapely flowers for exhibition purposes

Treatment after Flowering.—After flowering, Chrysanthemums normally rest for a short period and then send up a crop of young shoots from the base. In the case of pot plants they are encouraged to do this quite early in the year, in fact, early in January. As soon as the new growths are long enough, they are taken off as cuttings and rooted in sandy soil to be treated as already described.

In the case of the hardy early-flowering varieties, the plants are, in congenial gardens, sometimes allowed to remain in the border without disturbance. A good double handful of ashes or sharp grit over the crowns is adequate protection during the winter. In most gardens it is advisable to lift even the early-flowering varieties and house them

CHRYSANTHEMUMS

under glass during the coldest weather. The roots can be lifted when the tops have died down and packed closely together in the soil of the cold frame. As the lighter days come a little more moisture can be given to these roots to encourage fresh growth, and the shoots can be taken off and rooted in the same way as those for pot culture. If an increase is not desired the plants can be merely replanted in the border about April, but the use of young freshly-rooted plants is recommended.

CHRYSANTHEMUMS FROM SEED

The practice of growing Japanese Chrysanthemums from seed is increasing. It is an easy method of obtaining quantities of strong healthy plants suitable for border decoration and to provide cut flowers for the house. The seed is sown, in ordinary seed compost, under glass in February, pricked out as soon as possible, and grown on under cool conditions. The majority of the seedlings are usually singles, but very fine colours and interesting forms are obtained.

PESTS

The worst pest of Chrysanthemums is the Black-fly, which should be anticipated early in the summer. The best cure is to spray with nicotine wash or dust the tips with tobacco dust, using small bellows for the purpose. Spray as a prevention; do not wait until the pest has actually appeared. If it does show up, then prompt measures must be taken (and repeated as necessary), to stamp it out immediately.

Another obnoxious pest is the leaf miner. This is difficult to control because the fly lays its eggs and disappears, and the grubs which hatch out do the damage by eating their way through the leaf between the upper and under skins. They cause the well known silver-brown markings, and because they eat away the green of the leaves, the health of the plant is seriously affected. If plants are attacked, remove the affected leaves. It is better to prevent an appearance by early spraying with quassia extract and soap solution. Use this deterrent during May and June, when the fly is most active. Also look out for weeds, such as groundsel, which harbour this pest, and be sure that all such are pulled up and burnt.

Another pest which sometimes appears is the red spider, which is best controlled by spraying with ordinary cold water. An occasional dose of soot water, made by immersing soot in a barrel of water, is useful as a stimulant, and helps the plants to resist all kinds of pests.

LEAF RUST

This is a fungus trouble which has been very prevalent of late years amongst Chrysanthemums. It can only be treated by the use of a

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fungicide, and as it is believed that the spores exist in the soil it is recommended that the soil should be treated with fungicide before it is used for potting. Special preparations are sold for the purpose but the use of Cheshunt Compound, as in the case of a soil prepared for tomatoes, should be effective.

VARIETIES

For cutting in spray form, and for general garden decoration, "Crimson Circle," "Pink Circle," "Daffodil," "Mrs. Phil Page (red), and "R.A. Roots" (white), are recommended. The dwarf varieties, "Polly" and "Elsie Heady" are both excellent for bedding.

A very brief selection of Chrysanthemums (in each of the recognized Show groups), recommended for exhibition, is as follows:

Japanese: "Mary Kirkwood" (yellow), "Henry E. Truemann" (white), "Freya" (mauve), "Mrs. A. Holden" (crimson).

Incurved: "Advancement" (white), "Aloma" (yellow), "Progress" (pink).

Anemone-flowered: "Thora" (a circle of rosy rays with prominent pink centre), "Winsome" (crimson with pointed florets).

Pompons: "White Midget," "Ethel" (red), "Yvvaawn" (yellow).

Singles: "Bronze Phyllis Cooper," "Dorothy" (pink).

(There are also varieties of Chrysanthemums with quaint spidery or feathery blooms which cannot be classed with any of the above groups).

The new "Cascade Chrysanthemum" is merely a small flowered variety, which is cultivated so that it forms a floral cascade from the top greenhouse shelf to the floor. It can be obtained in bronze-red, yellow and white.

The effect is produced first by frequent pinching-out, to create bushy growths, then by tilting the stake on which the plant is trained, towards the North, almost horizontally. This causes the side growths to develop on one side only of the main stem. Finally, the stake is removed, the pot is turned round, and the plant falls as a cascade.

PYRETHRUM "the poor man's chrysanthemum" is aptly so called. It requires no heat for its cultivation, will grow all the year in the open, and supply a double harvest of cut flowers in profusion, one in spring, and the other in autumn.

Rich green finely cut foliage enhances its value in the border, and either the double flowers, which resemble China Asters, or the single ones which are like coloured Marguerites, are fine decorations for garden or house.

They grow well in ordinary garden soil, and should be planted 18-in. apart, in spring, in a good rich loam. Well drained, deeply-dug soil with the addition of some well-rotted manure, suits them admirably,

CHRYSANTHEMUMS

and in the event of exceptionally dry hot weather, a mulch of old manure on the surface will conserve soil moisture.

During the winter months, finely-sifted coal ashes are used to cover the crowns to protect them from the attacks of slugs.

There are a number of new hybrids, of which the following are good for ordinary garden decoration:

SINGLE

Agnes Mary Kelway, bright rose; Albert Victor, crimson; Belle of Somerset, white; Christine Kelway, creamy white; James Kelway, scarlet crimson; Primrose Dame, pale primrose.

DOUBLES

Queen Alexandra, pure white; Queen Mary, pink; Pericles, golden yellow, with creamy-pink guard petal; Lord Rosebery, amaranth-red.

Chrysanthemum coronarium is a species often sold as a pot flower in the markets. It grows to a height of 1 ft. and has double flowers in white, primrose or golden yellow.

Seed is sown in February or March, and grown in the greenhouse, as cool as possible, so long as it is protected from frost. Plants are "stopped" once or twice, to make them branch well. Seed can also be sown outdoors in March or April.

C. segetum, or Corn Marigold, is obtainable in two named varieties, "Morning Star"—pale yellow, and "Evening Star"—golden yellow, both single flowered and both 2-3 ft. high. They deserve far more popularity than they have at present.

C. tricolor (carinatum), is distinguished by having bands of crimson, red and yellow, and white or orange surrounding the central disk. It is very hardy, and if sown in autumn it stands through the winter and flowers much earlier than when sown in spring.

C. inodorum (Bridal Robe) is a white flowered, feathery leaved, bedding plant, most useful for borders, particularly in sunny positions. This is usually raised under glass in boxes.

With all these species the main points to remember are to give them plenty of room to develop—to keep weeds down with the hoe—to plant them in ordinary well-dug soil, and to cut off dead flowers regularly to prolong the season.

OTHER HARDY PERENNIAL CHRYSANTHEMUMS

C. leucanthemum, *C. maximum* and *C. uliginosum*—the Ox-eye and Shasta daisies, need no special treatment, except that, as they increase so rapidly, annual division of the roots is advisable. In dividing, it

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is well to discard the central worn out parts of the rootstock, and to replant healthy pieces from the outside of the clump.

C. maximum is best divided in April. It is a fine showy plant in the border, and is obtainable in named varieties, such as: "Mayfield Giant," "Mrs. Lothian Bell," "Curly Head" (with incurved petals), "Kenneth" (fringed), and "Marion Collier" (semi-double and fringed).

MARGUERITES (*C. frutescens*) are more tender than most of the species. They need plenty of leaf mould and sand, and make useful decorative pot plants or bedding-out plants, for summer.

For fine pot plants, cuttings must be taken in April. These cuttings are small side shoots cut just below a joint, and inserted singly in small pots filled with three parts sand and one of leaf mould. Stand the pots in a propagating frame, and when roots have formed, pot up into 3-in. pots with equal parts of loamy soil and leaf mould and one quarter silver sand.

In August, re-pot into 5-in. pots with similar compost. Move into a greenhouse with 50° temperature in September. Give sufficient, but not excess, water, and when roots fill the pots give occasional doses of liquid manure. Plants that have flowered are worthless, and only new-rooted cuttings should be preserved.

SPECIES FOR THE ROCK GARDEN

C. alpinum with short-stalked white Marguerite flowers, is not easy to rear. Light gritty soil, without any lime suits it best.

C. arcticum has rose pink, high standing Marguerites, with low growing foliage.

C. hispanicum has downy silver grey foliage, with golden yellow flowers.

All are propagated by division, but *C. alpinum* should be planted, after division, in well-drained pots under shade.

DAHLIA. Compositæ, i.e. the daisy family.

Less than 150 years ago the Dahlia was to the civilized world an unknown flower. It grew at an altitude of 5,000 ft. up the Mexican mountains and was called by the natives Acocotli.

To-day there are more than 150 varieties "selected for general use." It has crossed the Pacific to Australia and New Zealand, and the Atlantic to Europe. It grows to its greatest size in the U.S.A. where it claims a diameter of 14 to 16 inches. Its most beautiful miniatures are found in France and England. Careless whether it grows on the heights or at the sea-level, it is everywhere "Queen of the Autumn" by reason of its brilliance of colour and grandeur of form.

It was when a Spanish physician, Francisco Hernandez, was com-

DAHLIAS

missioned by Phillip II of Spain to report on the plants and animals of Mexico that Europe first heard of the Dahlia.

A Frenchman, Menonville, sent by his government to study the cochineal insect, also described it as one of the beauties of the mountains. Plants and seeds were sent to Madrid in 1789, and the Marquis of Bute, Ambassador to the Spanish court, sent some to his home, and some to Kew Gardens.

They were successfully raised at Kew, but afterwards they were allowed to flower so continuously that they became exhausted and died. In the same year, the Abbé Cavinilles, Director of the Royal Gardens, Madrid, sent plants to a Swedish botanist André Dahl, whose name was eventually given to the new plant.

All growers, during the first half of last century, concentrated on producing imposing varieties. Later, some lighter, more decorative types were introduced. In about 1880, Mexico sent us another plant named *Jauresii* after one of the Mexican Presidents, which proved to be a distinctive and striking form, brilliant scarlet, and with curving cactus-like florets.

Exhibited at the 1882 R.H.S. Show, it roused immediate interest, and growers strove thenceforward to produce new and distinct types. The large *Double Decorative* class came gradually into favour, and then appeared *Collarettes* from France, and the *Stars* raised in our own country. Since then the *Tom Thumb* or *Mignon* type, dwarf bushy singles, valued for edging and bedding purposes, the *Anemone* and *Clematis-flowered*, and the *Orchid-flowered* types have been introduced, and these with the smaller types of Stars and Collarettes are now used commonly for indoor decoration.

In our public parks, long borders and banks of the taller dahlias, and beds and borders of the dwarfs form magnificent displays from July till the frosts cut them down. No other late summer outdoor flower gives so fine a show for so long a time.

For those who are interested in the cultivation of this attractive Mexican let us consider:

1. Selection of sites.
2. Preparation of soil.
3. Types for various purposes.
4. Planting methods.
5. Attention during growing season.
6. Seeds and seedlings.
7. Lifting and storing of tubers.

The Selection of the Site for dahlia cultivation depends on available space, and on the purpose for which the plants are grown.

To get the full effect for massed tall Dahlias, a position in front of a shrubbery is ideal. With such a foil to beauty, the bright colours of "Lowfield Scarlet," "Prestige" (deep orange) or "Jersey Beauty" (clear salmon pink) are not easily forgotten. Beds of distinct colours may be preferred, to suit a formal planting scheme, or it may be

TYPES OF DAHLIAS



CHARM



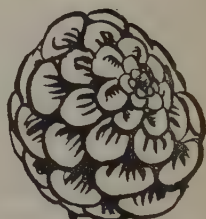
STAR



CACTUS



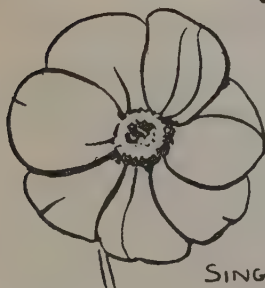
SMALL DECORATIVE



POMPOM



LARGE PAEONY



SINGLE



COLLARETTE

The various types of Dahlias sometimes confuse the amateur. Here their differences are clearly shown

that the dahlias are grown chiefly for cutting, in which case any position in full sunshine will suffice.

Soil Preparation involves hard labour. The ground must be dug very deeply in the autumn previous to planting, and it should at the same time be heavily manured. Dahlias are heavy feeders and need liberal supplies of food and moisture, which only deep digging will ensure.

Purpose and Variety.—There are now very definite sections into which the various types are grouped. The following are the main sections, and all have a special place in garden decoration: Single, Star, Large decorative, Small decorative, Cactus, Pæony-flowered and Pompoms.

The dwarf varieties are the most suitable for massing in flower beds. "Coltness Gem" is now familiar to all, and though not quite so vivid, is a very good substitute for the Paul Crampel geranium in bedding schemes. "Princess Elizabeth," crimson scarlet, "Harrogate" a clear rose colour, and the rich bright "Purple Robe" are other dwarf types that display well *en masse*.

Coloured Globes.—The Pompom types have tiny globular flowers in every known dahlia colour, and "Darkest of All" (maroon), "Glow" (rich coral) and "Little Beeswing" which is yellow, heavily edged with red, a very striking bloom that never fails to attract, are all worthy of a place in the amateur's collection.

The Cactus types are favoured by many gardeners, and these may be given a position in the mixed border. "Redpole" in deep crimson, "Golden Red," and "Edgar Jackson" a coral red flower, are three good varieties for association with other plants.

Stars among Dahlias.—The type known as "Star Dahlias" owe their origin to a British firm. The delicately pointed petals of this type make it most desirable for use in the house vases, and nothing can exceed the richness of the colour found in such varieties as "Surrey" (tangerine) and "Rusper" (crimson) "Crimson Star" and "White Star" are also good forms.

The varieties mentioned in each group are, however, only a few out of many excellent plants, all suitable for some position in the gardens, and all, except the largest decorative varieties, useful for indoor decoration.

Plants should be chosen according to the purpose in mind, and obtained early in March from a reliable source, so that they can be repotted and kept in a cool greenhouse until May or June. This ensures strong plants to put out in the borders and encourages early flowering.

General Cultivation.—The cultural requirements of the dahlia are these: protection from frost, adequate feeding, including the plentiful supply of moisture, and, in the case of tall varieties, the provision of stout stakes. Dahlias break easily in strong winds unless staked in good time.

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If large blooms are required, a certain amount of disbudding must be done, but for general garden decoration this is unnecessary.

Method of Planting.—The ground is first measured and staked, leaving 4 to 4½ ft. between the stakes for the tallest varieties, 18 in., for small ones. This allows the plant to be tied at once, and avoids any danger of damage to the root which might occur were the stakes driven in after planting. The probable height of each plant is noted and proportionate stakes allocated.

A good plan when planting, is to dig out a hole a few feet in diameter, and to work into the subsoil some old decayed manure. This helps to retain moisture for the plant roots, and at the same time improves the drainage so that the soil water does not stagnate. Fill in the top soil, but leave a saucer-like depression round each plant as it is put in position, so that rains tend to flow towards the roots. To discourage the attentions of slugs, who attack the young growing plant, soot may be sprinkled round it.

Attention during Growth.—As shoots develop, tie them firmly to the stakes. Disbud only if exhibition flowers are desired, but remove seedpods regularly, to ensure continued flowering. Water, in dry weather, from time to time, using liquid manure. Soot or cow manure, left to soak in a tank, provides excellent liquid manure.

Pests.—Check any onset of *Black-fly* by spraying with an insecticide such as nicotine. Dust plants with tobacco powder, or sulphur, to keep *earwigs* at a distance. *Wasps* are best dealt with by providing a counter attraction in the form of half-filled bottles of jam and water, plus raspberry vinegar. These bottle traps can be periodically emptied of wasps and renewed.

Seeds.—Dahlias are easily, and now very frequently, raised from seed sown in March in pans or boxes in a greenhouse or frame. The young plants are potted and planted out in the usual way. The seedlings are of mixed quality, and therefore not recommended for every garden, but some strains are so good that really worth-while plants are obtained, many of which are worth increasing in subsequent seasons.

Lifting and Storing.—A keen autumn frost ruins the dahlia in a night, and it is well when this happens to cut off the tops, and leave them heaped over the roots for a week or so. This ripens the “eyes” round the crowns, which can then be lifted, and dried. A good stiff breeze is better for drying the tubers than strong sunlight which may make them tender. When partially dry, use a whisk broom to clear off as much of the adhering soil as possible, so as to promote even drying, and prevent decay.

Allow 24 hours for evaporation, then pack away in dry soil,

DAHLIAS

sand, peat or sawdust. Sawdust is specially good. Sand is heavy enough to break some of the tender roots, and sawdust is a medium in which tubers may be kept in safety far into the summer, if delay in planting occurs.

Experiments made in 1928 showed that the previous season's dahlias in sawdust had made sprouts 1 ft. long in July. These were planted with great care, the sprouts being gently propped up by moulding earth round them. In 10 days, they were upright, and fully leaved, and compared favourably with unsprouted dahlia tubers that had been growing for six weeks. This was a clear gain of four weeks for the plants sprouted in sawdust, and the plants flowered and formed strong tubers before the frosts came.

When clumps are divided in the spring, the sections may be re-packed in paper bags full of the same sawdust, and they will retain their moisture up to the moment of planting, a great advantage, as drying means shrinking, and a shrunken tuber is sluggish even if it does not die.

If it is not desired to increase the number of plants, the tubers may be taken from store, cleaned, and planted in open ground in early April, covering the crowns with ashes in case of late frosts.

The greenhouse method of increasing stock is begun in February or March, when tubers are cleaned, and planted in soil. Five-inch pots are prepared with a deep layer of clean broken crocks, a light compost, and $\frac{1}{2}$ in. of sand on top. A stick with a flat end, about the size of a small bamboo, is pressed into the soil in the centre, and in places round the rim, the shoots that develop on the tubers are taken off when 2-5 in. long, and inserted as cuttings. The varieties are labelled, and the pots placed in a greenhouse and syringed two to three times a day to prevent flagging. Mild heat in the greenhouse is needed in most districts.

Tub Culture.—The dahlia, which is excellent for town gardens, is also useful for town houses where no garden exists, for it can be easily and well grown in tubs. A small wine cask makes two ideal dahlia tubs if sawn in half. They should be provided with drainage by means of holes bored in the bottom. Over the drainage holes, a layer of broken crocks is placed, and then rough fibrous matter, i.e. dead leaves, or florists' fibre is laid over the crocks. Then a good layer of rotten manure is put in, and soil added to within 2-3 in. of the rim. One plant is set in each tub, watered well, and immediately staked.

Later, when the plants are about 1 ft. high, a top dressing of good soil can be added, to be washed in by the rains. Grown in this way, an effective display of flowers will be obtained from late July until the frost comes.

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Some varieties that will reward good culture are:

SINGLES

Albatross,	white.
Beacon,	golden yellow.
Brilliant,	crimson scarlet.
Lady Bountiful,	deep pink.
Little Jennie,	carmine shaded, gold edged, rosy mauve.
Winona,	deep maroon.

PEONY FLOWERED

Commander,	rich purplish crimson.
Hadley,	deep rosy cerise.
Lady Greer,	lovely shell-pink and pale rose.
Major,	mahogany red.
Snowdrift,	white.

DECORATIVE

Berengaria,	orange with gold sheen.
Jersey Beacon,	bright red.
Polar Bear,	white.
Schwerin's Wahl,	golden orange, violet reverse.
Thomas Hay,	clear lilac.

SMALL DECORATIVE

Cheal's Pink,	pink tipped with silver.
Sonia,	apricot yellow. suffused with red.
Topaz,	brilliant scarlet.
Verity	canary yellow.
Wadsworth,	

COLLARETTES

Admiral,	blackish maroon.
Esther,	deep violet.
Lowfield Beauty,	crimson, yellow collar.

STARS

Belmont,	rosy salmon, yellow centre.
Charlwood,	fiery orange, tipped red.
Crimson	rich, velvety.
Epsom,	coral red.
Golden,	yellow.
Tilgate,	plum colour.

SMALL PEONY

Cheal's White,	white.
Dazzle,	scarlet.
Gladys Cooper,	apricot
Morning Glow,	rich glowing red, yellow base.
President Hoover,	velvety red.

MEDIUM DECORATIVE

Lady Snagge,	terra-cotta suf- fused with rose.
Nagel's Ideal,	nearest approach to a blue dahlia.
Ullswater,	yellow at base, suffused rose, shading to pink.

CACTUS

A. E. Amos,	deep crimson.
Golden Rod,	deep yellow.
Mrs. F. Warner,	white suffused light rose.
The Arun,	salmon, rose, and pale yellow.

SHOW AND FANCY GLOBULAR

Duchess of York,	lemon, edged salmon pink.
Goldsmith,	yellow striped crimson.
Marjorie,	fawn.

DELPHINIUMS

POMPONS

Adelaide,	blush edged
	lavender
Electra,	deep orange.
Tommy Keith	red tipped white

MIGNONS (single) small plants.

Burma,	brilliant scarlet.
Josephine,	primrose yellow.
Lady Aileen,	pink with darker centre ring.

DWARF BEDDERS

Aureola,	buttercup yellow.
Preston,	vermilion.
Purple Robe,	bright purple.

DELPHINIUM (*Ranunculaceæ*) LARKSPUR

The Delphinium is a "modern favourite" that was known to the Pharaohs and christened by the Ancient Greeks, who saw in its unopened buds a strange resemblance to a "little dolphin." Our Elizabethan forefathers, according to Gerard, noted the shape of its horned nectary and called it "Larkes heeles."

In Stuart days, the royal apothecary lists "Larkes heeles, larkes spurres, larkes toes or claws, and Munkeshoods." Its relationship with Aconitum or Monkshood may explain the statement that the Romans used its powdered seeds as an insecticide.

Continental growers were the first to succeed in hybridisation and extensive cultivation, but in England forty years back, after long experiment, Mr. James Kelway introduced his "King of Delphiniums," which was not only the greatest advance to date, but the forerunner of most of our modern Show varieties.

He also introduced "Persimmon," still a favourite among the Belladonna group, dainty border plants with glorious blue flowers and short growth, much valued as cut flowers.

The old blue Belladonna had hitherto refused to seed, but in the nineties it was coaxed into temporary fertility by Mr. Gibson of Leeming Bar, and from the five plants then raised from seed, two of outstanding merit, "Grandiflora," and "Mrs. Gibson" were cultivated. They have produced, through the efforts of English and Dutch plant-breeders, the majority of the Belladonna hybrids we possess.

Among Delphinium growers there has been a successful striving after size, and also the production of other colours than blue, and "Delphinium Blue" almost threatened to become a meaningless term, but lately there has been a welcome revival of the cult of the pure tint.

The Delphinium family is not all blue-flowered. For instance there are *D. californicum*, a 3 ft. border plant from California, vivid scarlet; and *D. nudicaule*, a scarlet Californian plant, adopted by us for the

enrichment of the Rock Garden; *D. Zalil*, a buttercup yellow beauty found only on the slopes of Afghan's mountains, and not yet acclimatised to our damp days, and double white seedlings of America's "Odeur de Luxe" which proudly boast a sweet fragrance redolent of Roses and Spanish Broom.

The popular garden delphiniums are hybrids between several species such as *D. elatum*, *D. cheilanthum*, and *D. formosum*.

Culture.—For the growth of fine exhibition Delphiniums there are several essentials:

1. Sun and air. The drips from, and shade of trees are anathema.
2. Ample water supply.
3. Some shelter from prevailing winds.
4. Deep digging before planting, i.e. at least 3 ft. The tall plant needs to root deeply for anchorage as well as for sustenance. Even more important is the presence of moisture in the soil, which only deep digging will ensure.

5. Manuring. On light soil use preferably farmyard manure, or well-rotted leaves, spent hops, and bonemeal. The manure should be well mixed with the soil, the first application at a depth of 12-14 in., and a second lot as the soil is being replaced at a depth of 8 in.

On heavy clay soil, digging must be accompanied by the addition of builders' rubble at the bottom of the trench, to allow of better drainage, and coarse sand or grit should also be added with the manure, while the surface must be well limed.

In both cases beds should be prepared before Christmas, and planting should not begin till the end of January or beginning of February, not then if there are hard frosts at the time.

New plants should be bought from a reliable nursery. When planted they should have from $\frac{1}{2}$ —1 $\frac{1}{2}$ in. of new growth. They can be planted whole 2 or 3 ft. apart, or if split carefully into two or three small plants, they need be only 12-15 in. apart. As stems develop remove any weak ones. To keep off slugs, put a good spadeful of coal ashes, builders' sand or mortar rubble close round the crown of the plant.

Fertilizers.—In May give a slight sprinkling of sulphate of ammonia. Mulch with hop or farmyard manure in summer to prevent the ground drying and cracking. In autumn clear away dead foliage and cover the crowns with sharp grit and builders' rubble. Dress with lime in winter to prevent sourness of soil. Plants will give their best spikes the second year after planting.

When the flower spikes begin to form, feed in a circular trench round the plant, with liquid manure, to increase the size of the spikes, but do not let the liquid touch the crowns. Well soak with water first if the

DELPHINIUMS

season is very dry, and repeat the soaking twice a week until rain comes. Each plant may send up a number of spikes—thin these out to 3 to 7 on a plant, according to its strength.

Stake Firmly.—For exhibition each spike singly, but for ordinary garden decoration three or four strong stakes round the plant, and a thick string tied round and to each stick, to hold the spikes in place, is sufficient.

When the flowers have faded cut the stems down to the ground, as the plants will then send up fresh growths to flower in the garden during late summer (when blue in the garden is very welcome).

The plants usually flower best in the second and third years, after which quantity prevails and quality deteriorates.

When cutting for vases or exhibition do not cut too low in the hard woody stems, as the cut blooms cannot then absorb enough water. It is advisable to cut in a slanting line across the thick stalk, so as to provide a larger surface for absorption.

When growing for exhibition, drench the ground of the Delphinium border with water a few days before the show is to be held, *not* watering the flowers and leaves. Cut the flowers early before the sun is up. Cut the stems as long as possible, take off most of the leaves, and stand the spikes in deep water almost to the base of the flowers, but keep the flowers dry. If they have to travel far, pack each spike in tissue paper, and lay them side by side in a long box, such as an egg case. Then put in a second layer with their heads the other way, and repeat, but do not have so many layers as to crush the bottom flowers. On arrival unpack at once, and again stand the spikes in deep water while you prepare for staging.

Culture from Seed.—It is quite simple to grow Delphiniums from seed, and for those who care to do so, the following hints may be useful:

Seed can be sown in a warm greenhouse in February or in the open garden later. For early sowing, prepare boxes of soil consisting of equal parts of loam, leaf-mould and sand. Lightly press down the soil. Water with a fine rose watering can and leave to stand for a few minutes. Scatter the seed thinly, and sprinkle over it a mixture of one-third loam, and two-thirds sand, until the seed is covered to its own thickness. Cover the boxes with glass. Shade with sheets of paper, and stand them in a hot-bed. Reverse the glass from time to time, and wipe off the drops of moisture. In 10–14 days the seedlings appear. The paper is then removed and the glass is raised by degrees. During the hours when the sun shines directly on the box give shade as required.

Water from below, by standing the box in a pan of water whose depth does not exceed that of the soil in the box. When the first pair of true leaves appear, remove the boxes to the cold frame, and give all air

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possible on suitable days. When the true leaves are 2 in. long, prick out the seedlings, 2 in. apart each way, into a frame filled with a similar compost to that in the seed boxes.

In April or May plant out into well-prepared rich soil, 18 in. apart, and when well established, sprinkle the ground, *but not the plants*, with a little sulphate of ammonia.

To prevent mildew, spray with a solution of potassium sulphate, $\frac{1}{2}$ oz. to a gallon of water, at least twice before the flowers appear.

Keep the soil fresh and free with the hoe and discard weak or unhealthy plants from time to time.

BELLADONNA DELPHINIUMS

These good tempered plants neither require a select position, copious watering, feeding for show purposes, nor any other form of cossetting.

They can be indeed treated like the majority of the occupants of the herbaceous border. Provided with good garden soil, a few hazel twigs or pea sticks to splay out their stems, and with water in time of drought, they will produce a mass of flower over a long period without special feeding. Anywhere in the border suits them, except the extreme background, where they are hidden, or the front edge where even their 2 ft. 6 in. is rather too high. They are compact in habit and do not spread among the surrounding plants. Their leaves are finely cut, their stems slender and wiry, and petals usually sharply pointed, so that for home decoration they are more acceptable than their larger brethren, and for that reason alone should have a place in any garden.

Some recommended varieties are:

- Belladonna grandiflora, skyblue, $3\frac{1}{2}$ ft.
- „ Lemartine, intense violet, $4-4\frac{1}{2}$ ft.
- „ Theodora, medium blue shaded mauve sepiæ centre, 4 ft.
- „ semiplena, soft palish blue, $2\frac{1}{2}$ ft.
- „ Isis, deep purplish blue, $2\frac{1}{2}$ ft.

There are a multitude of good hybrids among border delphiniums, of which the following can be recommended for garden and for exhibition:

SINGLE

- Afghan Queen, medium sky blue, khaki eye, 5 ft.
- Anne Hathaway, porcelain blue, white eye, 5 ft.
- Blue Danube, rich medium blue, light brown eye, 6 ft.
- Constance, gentian blue, white eye, 4 ft.
- Mrs. Townley Parker, soft clear blue, $5\frac{1}{2}$ ft.
- Blue Boy, bright blue, white eye, $6\frac{1}{2}$ ft.

FERNS

DOUBLE

Lady Eleanor, sky blue and mauve, 6 ft.
Mrs. Foster Cunliffe, pure mauve, $4\frac{1}{2}$ ft.
Lady May, delicate bluish mauve, $4\frac{1}{2}$ ft.
King Bladud, rich cobalt blue, 5 ft.

SEMI-DOUBLE

Mrs. Paul Nelke, cornflower blue, white eye, $5\frac{1}{2}$ ft.
Lady Elizabeth, lavender and blue, 5 ft.
Advancement, blue and mauve, 6-7 ft.
Blue Gown, brightest ultramarine, black eye, $5\frac{1}{2}$ ft.
Hewitt's Superb, lavender mauve, khaki and yellow eye, 5 ft.
Pompadour, Reckitt's blue, brown eye, 5-6 ft.
Rose Marie, deep violet (a mildew resisting variety), $5\frac{1}{2}$ ft.
Shah, rich lavender and rose-pink, dark eye, 5 ft.

RANUNCULUS FLOWERED

Lady Bath, deep blue shaded lavender, $4\frac{1}{2}$ ft.
Lady Betty, medium blue, 4 ft.
Rosette, deep purple edged blue.

The Annual Larkspur in as varied colours, but of slighter less robust build, is an annual species of the delphinium family which is almost as popular as the "King of the Border." (For its culture *see* CHAPTER IV.)

FERNS

"Flowers may come and flowers may go but I go on for ever," might well be said by the ancient fern at Kew Gardens, looking back over the 3,000 years of life computed to be its portion. And that is one individual of a race whose origin is lost in the mists of antiquity. Its beautiful markings appear in our coal measures, and that dates it back beyond human history into the earlier geological eras.

It flutes its edges and tassels its tips like a seaweed; its spores cannot be fertilized in the absence of moisture, and its general characteristics hint at an early life in the waters that covered the earth. Age has not limited its activities, and in all climates—in every variety of place—summer and winter, indoors and out, the fern's green plumes rest the eye, and excite the interest of man.

Varieties of Fern.—As a family its branches are endless. Of British species alone there are close on fifty, and some of these have more than fifty varieties, so that it is not easy for the amateur to distinguish one fern from another.

Some of the hardier varieties are frequently sold by hawkers and

used on rockeries, or as pot plants. A short description of a few may help the grower to identify those he has already, and interest him in acquiring others.

THE BRITISH MAIDEN-HAIR FERN (*Adiantum capillus veneris*) is so delicate that a warm coastal situation, a warm draughtless house, or cultivation under a bell-glass are essential for its well being. It cannot live where gas is used, and as, in its native haunts, it dies down in the winter, it is advisable to give the plant a rest period by withholding water when the foliage begins to wither. The fronds should be cut back as they die. A fresh crop will appear again in spring. The Maiden-hair Fern has a dark wiry stalk and small delicate fan-shaped fronds. Planted in broken peat, silver sand and a little loam, with a sprinkling of charcoal to sweeten the soil, kept warm and moist, but without direct sunshine, it will flourish in warm districts. The hardier species, *Adiantum pedatum*, from North America, will grow freely, with similar cultural treatment, in most parts of the country.

THE PARSLEY FERN (*Allosorus crispus*) resembles garden parsley, but its fronds vary from smooth-edged to cut-edged pinnules, even in one plant. It is a mountain fern living mainly among loose debris, and no ordinary pot or garden culture suits it. One specimen brought to London was preserved in a unique way. A hole was dug, a foot deep, and filled with rough brown peat and loam, mixed with coarse sand and gravel. On this was spread the matted fern root with its growing end northward. It was then completely buried with a spadeful of gravel, covering the roots; on the south side a large brick mass about 2 ft. high was dumped. The whole was drenched with water and left. Apparently regarding the falls of stone and rock as a usual thing, it pushed its fronds through the gravel and grew season after season, as if on its native mountain-side.

THE SPLEENWORTS (*Asplenium*).—These are little ferns found, summer and winter alike, in the crevices of old walls. One variety is the Wall Rue, with a small knob of fine roots, and diminutive spreading stalks each with a small group of pointed oval pinnules arranged in triplet form at the top.

Another common variety, the Scaly Spleenwort, is leathery leaved, somewhat larger, and with narrow fronds. Moreover its stalkless pinnules are placed alternately so as to form a wavy outline to the frond. It, too, roots in the mortar of old walls. These are both difficult to cultivate, though common enough in nature's gardens.

THE LADY FERN (*Athyrium-Filix-fœmina*) is a very well known fern—bright green, of soft texture, and growing in tufts, in moist woods, and along road-side ditches. The spaces between the pinnules are not large but are sufficient to give a light and graceful appearance, in spite

of its occasional 5 ft. of height. It dies down completely in the winter. Some of the varieties are wonderfully crested or branched at the ends of the pinnæ, and frilled out of all recognition—and some grow into such closely and minutely branched and rebranched pinnæ, as to resemble tall thick plumes of green.

Culture is easy. The fern is not dainty as to soil, and the usual loam, leaf-mould and sand compost is equal to its needs. Water must not be spared, even in winter, for though the fronds are then invisible, in natural conditions the Lady Fern is bathed in moisture at that season, and if allowed to become dry, it will perish.

HARD FERN (*Blechnum spicant*).—An evergreen of 1-3 ft. in height—is very tough and leathery, with long narrow fertile fronds rising from a lax spreading rosette of non-fertile ones. Its pinnules have smooth edges.

As its home is a moist hedge-bank, stream-side or damp wood, or among the heather on hillsides, it will grow well on a rockery with a northern aspect, provided there are good pockets of friable loam with peaty or leafy material and an entire absence of lime or chalk. Rain water must be used if watering is needed, as hard water may kill the plant.

MALE FERN (*Lastrea Filix-Mas*).—A sturdy 5 ft. plant, whose fronds rise in circles from a stout root stock to form the well-known shuttlecock-shape. It does not, like the Lady Fern, die down altogether in winter, but its fronds lie flat and appear limp. It is the most usual fern in amateur's gardens, and is quite easy to cultivate in rockery or garden bed, though naturally it responds best to the fern soil, i.e., sandy leaf-mould and loam, and ample watering.

ROYAL FERN (*Osmunda Regalis*).—The largest of British ferns grows deciduous fronds, 10-12 ft. long. It is found wild in Devonshire, along the upper reaches of the Dart, on islands in lake districts, and in other thoroughly moist localities. Its massive rootstocks stand out of the ground, clothed thickly with aerial roots, like huge sponges, and its great fronds, twice or thrice divided into pinnæ with their smooth-edged pinnules, make it unmistakable. It can be grown in spongy peat, kept perfectly moist, but it requires so much room that in most gardens it would be unwelcome. The upper pinnæ die off as the brown spore-masses ripen, and resemble a dead spiræa flower in general appearance, hence it has been mistakenly called The Flowering Fern.

POLYPODIES.—The Common Polypody is an evergreen fern with blunt pinnæ set rather far apart so as to resemble a double comb with blunt widely-spaced teeth. It grows from 1-2 ft. high, and is found in such differing places as on old walls and roofs, the forks or trunks of old trees, on woodland debris, or rocky mounds.

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The spores and their cases are unusually large and brilliant yellow as in no other British species.

The thick fleshy rootstocks run along the surface and the fronds spring up singly, not in clumps. A more dainty species is the feathery triple-branched Oak fern, which looks like three small triangles. It only grows 6-8 in. in height and is a particularly delicate "moonlight green," so that it is one of the prettiest to cultivate. It dies down in the winter, but its spring growth is curious in that its three fronds at one stage hang like a pawnbroker's sign.

It will grow well under glass, in a well-drained pan filled with very leafy, loose, sandy compost, and with ample water supplied; but it needs shelter from sun and wind.

THE SOFT PRICKLY SHIELD FERN (*Polystichum angulare*) is a beautiful evergreen fern with stalked pinnules and very graceful form; a somewhat open spacing of the pinnæ makes it light in appearance, and it grows most freely in the warm, damp West. The genus lends itself to innumerable variations—forks at its pinnae tips, crests at its top, and the limitless branching of the plumose type, but the whole family is named and known by the little mushroom-shaped shield that protects the spores at the back of the leaf. They are hardy ferns and, being circular in growth, make good plants either for pot or rockery.

COMMON BRACKEN (*Pteris aquilina*) is a handsome, well-known plant on heath lands and commons, in woods and on hill sides, where it spreads vigorously. It is hardly less beautiful in its brown winter garb than in spring's fresh green. It is, however, difficult to remove, as its rootstocks are both deep and brittle, and it is not advisable to introduce it into a small garden, as it is a rooted monopolist, and in a short time will oust everything else.

HART'S TONGUE FERN (*Scolopendrium*) is a hardy evergreen with quite undivided fronds. When it varies it is more in the direction of a deeply frilled edge, but there are some crested and tasselled tops in the family.

It is a very useful rockery fern, and with its basket-shaped growth will look well in pots in its youth; old plants become rather heavy. It grows well in mixed loam, peat and sand, but is probably benefited by the addition of a little lime; indeed it is particular in only one matter, that it must be kept supplied with water.

FERNS GROWN IN A ROCKERY should be planted according to their mature size, the larger Basket or Shuttlecock-shaped ones being put among the lower stones, and the more delicate and smaller varieties in the upper pockets, e.g. Male fern, Lady fern and Prickly Shield might be used round the base, Hart's Tongue higher in the rockery, and small

specimens of the common Polypody near the top. In every case it is essential that there should be some shade from the sun; that the construction of the rockery allows of good drainage; that the pockets or crevices are deep and filled with a compost of equal parts of loam, leaf-mould and sand; and that watering is judiciously done.

PROPAGATION OF FERNS.—There are three main methods by which ferns are propagated—the first through root action, the second through leaf action, and the third through the spores which are found on the backs of the leaves, and which ripen in summer. *In the case of the root* it may be that the rootstock, like that of many rhizomatous plants, can be broken up, and each part with its rootlets and growing point set in fern soil to produce a new plant, as in the Polypody.

It may be that, after the bulb fashion, the central crown makes offsets which speedily make their own roots, and if left, develop into an association of plants. These crowns are, however, better prised away with a trowel and reset, to form finer single plants.

A really old rootstock, through exposure, may appear well-nigh dead, but if all the dead roots and dead surface are cut away, and the internal green part is well washed and potted in a good compost under glass, bulbils may appear as white pimples on its surface, and each will, if encouraged, develop into a new plant.

REPRODUCTION FROM LEAF BULBILS.—It is the habit of some leaves, e.g. those of the Soft Shield fern, to grow bulbils on the axils or joints of the pinnae, and The Lady Fern will produce them on the backs of the fronds. If these are pegged down into fern mould, the bulbils will root, and can later be cut away from the parent plant.

PROPAGATION BY SPORES.—This is the only method in which the raising of new varieties is possible. The spores are exceedingly small, and might easily be destroyed or lost, but Nature provides bountiful supplies. The spores themselves develop in moisture into tiny green scales known as prothalli, which in their turn produce a minute fertilizing body, and contain an embryo seed. The union of these produces the new young plant. Spores of hardy ferns can be propagated if laid on pieces of clean sandstone kept under a bell-glass on the ground in a moist corner of the garden.

In order to grow the more delicate ferns from spores in a greenhouse, it is essential to sterilize the compost. Take a small pot and put in the usual drainage crocks, fill it with good fern compost pressed flat, and sprinkle crumbs of loam or crushed flower pot on the surface, on which paper can be placed to prevent disturbance.

Thoroughly saturate the soil with boiling water till the pan is too hot to hold. All germs or spores are thus killed. Let this cool, then scatter very thinly the required spores, which have been previously

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collected on a glass slip and freed as far as possible from any unwanted matter.

Finally cover the pot with a glass slip—stand it in a saucer in a well-lighted place out of the direct sunshine. In a few weeks the green scales will appear. No watering must be done from the top—a little in the saucer will suffice. A month or so must elapse, and then the tiny fronds should open to the light, and all that remains is to prick them out, and bring them on in the usual way.

FERN FOES.—Green-fly, White-fly, Weevil, Caterpillar, Black Snail, Slug and Woodlice are the foes that attack ferns, particularly those in a greenhouse.

GREEN-FLY is often due to insufficient ventilation; and better ventilation and an increase of light, if managed without draughts, will often cure the condition.

WHITE-FLY attacks both deciduous and evergreen ferns, but only lays its eggs on the fronds—those laid on deciduous ferns are in due time cleared away—and only the eggs on the evergreen ones are left to develop in the following season. The eggs hatch out in April when larvæ may be found gnawing away the skin of the foliage. In May the winged insect emerges from the chrysalis and the whole cycle begins again. There is thus a month from the time that notice is drawn to the pest by the dirty white gnawed lines, to the time when the winged creature appears, and in this month the pest must be cleared away. A greenhouse fumigant is used and this disposes of any stray green-flies as well as the white-fly.

The **WEEVIL** is more difficult to deal with since it can neither be killed by fumigants nor drowned, and in its beetle stage will not succumb to the other insecticides on the market.

As a fat white maggot it devours the root-stocks and roots of the plants and, as a young beetle which emerges from the soil in April, it eats pieces out of the fronds, the tender young ones preferably. If ferns are found loose in the soil, the pot must be turned out, the roots thoroughly washed to examine the caudex for holes, affected parts cut away, and what is left unaffected may be re-potted. The beetle will come to the surface if the pot is plunged in water, and can then be caught, but it is a night feeder, earth colour, and very cunning, so is difficult to find.

A **CATERPILLAR PLAGUE** can only be met by persistent hand picking.

Lady Ferns are sometimes attacked by a fly which pierces the stalk of the uncoiling top, and inserts an egg or two. The top wilts and the eggs hatch into two light-blue caterpillars which bore down the stem and into the caudex. If the stalk of the frond is cut off immediately the trouble begins, some inches below the wilted part, the eggs are destroyed, and the trouble stopped.

The **SMALL BLACK SNAIL**, with an onion-like smell, that attacks the

GLADIOLUS

bases of large fronds, can be traced by its slimy track and must be sought and killed.

WORMS and WOODLICE also leave tracks and should be turned out of the greenhouse.

A few of the ferns that can well be grown in a cool greenhouse are:

The MAIDEN-HAIRS. The British species, the *Adiantum cuneatum* from Brazil, with its wedge-shaped leaves, and the hardier *Adiantum pedatum* can all be used with advantage.

The CARROT TOP FERN.—*Asplenium bulbiferum* from New Zealand; light and feathery.

The RIBBON FERN.—*Pteris Cretica* (Crete).

PTERIS TREMULA.—A dainty, bracken-leaved fern from Australia.

PTERIS ARGUTA.—A bracken-leaved fern from Madeira.

GYMNOGRAMME CHRYSOPHYLLA.—A golden-leaved fern from the West Indies.

But such kinds as the Holly Fern, *Cyrtodium falcatum*, with its leaves cut into Holly-like segments, and the Golden Polypody will only grow well in a warmed greenhouse.

With all deciduous ferns it must be remembered that as they normally die down for the winter, they will require a rest time, and should be cut down when signs of flagging appear, and left somewhat drier—but never quite dry. In the case of pot plants, as soon as new young ferns show their curled brown fronds, they should be repotted.

GLADIOLUS (Corn Flag or Sword Lily)

Why has no musician composed a "Conquering March of the Sword Lily"? From its native fastnesses on Table Mountain, Cape of Good Hope, it has in a few short years stormed the floral citadels of the world, and consolidated its position in gardens of town and country, in greenhouses and on show stands.

Many years back there were in our gardens only a few European (non-British) species such as *G. communis* and *G. palustris*. These were and are hardy plants for sunny spots in the wild garden or mixed border; but the present popularity of the Gladiolus is undoubtedly due to the introduction of the Cape forms, *G. cardinalis* (red), *G. psittacinus* (yellow with purple spots), and *G. floribundus* (purple and white). These have been crossed and inter-crossed, and we now have *G. gandavensis*, the Ghent Gladiolus, and *G. Brenchleyensis* (the old scarlet Gladiolus first raised in England, 1848) and innumerable fine hybrids.

A further spurt was given to the general interest when in 1904 *G. primulinus* was re-introduced from the banks of the Zambesi. The species is called in South Africa "Maids of the Mist" because it grows in the spray of the Victoria Falls. This probably accounts for the over-

arching, hood-like upper petal, which forms a natural protection from the spray for the vital reproductive organs of the flower. With this new species, both Dutch and French growers, as well as our own experts, have made experiments in hybridization, and the majority of our modern strains are hybrids between early-flowering dwarf, large-flowered, and primulinus groups. For example, one of the Nanus (dwarf) group of early-flowering *Gladiolus* was crossed with a large-flowered variety to produce "Herald," a taller, earlier, larger-flowered type.

One of the *Colvillei* group crossed with a *Primulinus* produced *G. prinsianus*, which is a free flowerer, suited to either spring or autumn planting.

In America the receipt of a hitherto unknown, wild, scented *Gladiolus* from S. Africa has been used as a mate for "Tristis," which had but a faint suggestion of fragrance. Prof. F. T. McLean, Director of Education of the New York Botanical Gardens, produced in 1928 from the cross, *Gladiolus fragrans*, or in common parlance, "Sweet Glads." These are very slender, with rush-like foliage, and delicate, light-coloured flowers about 2 in. in diameter, four to six on a spike. Thus they are intermediate in size between a *Freesia* and a *Gladiolus*, with the *Freesia*'s gift of perfume. Colours are light cream or creamy yellow tinted with bronze, purple, or lavender. One is a light violet. Some of these hybrids are summer blooming and some winter blooming.

Another recent interesting "find" from among the wild flowers of S. Africa is a midget *Gladiolus* Mostertii, only 4 in. high, a gem for a pocket in the rock-garden. Its leaf is narrow-ribbed and very dark green, and its somewhat disproportionately large flowers bloom very late in the summer. America has sent us the new, curious, Orchid-flowered *G. orchideiflorus*.

The great assets of the *Gladiolus* are:

1. Reliability.—A clean corm will very rarely fail; from a dirty, scab-marked one success should hardly be expected.
2. Ease of culture.—Beyond ground preparation and proper planting, nothing else is required—rarely even a stake.
3. Lasting quality of blooming spike.—One plant will continue to bloom for three or four weeks.
4. *Accommodating habits*.—Blooms can be secured in a border for four months on end. (a) By planting corms at varying depths. One grower found that an increase of 2 in. in depth meant a delay of two weeks in the flowering of the same varieties. An Australian experimentalist succeeded in obtaining a flowering spike from a corm planted 30 in. deep. (b) By planting on varying dates. From early March to mid-May. (c) By planting corms of different varieties. In one test, thirty-four varieties, all planted on March 22nd and March 29th, flowered at intervals

of a day or two almost all through August and September, and some flowers were still being cut in mid-October.

So that a judicious choice of *variety* and *depth*, and *fortnightly planting*, will give an unfailing succession of colour and beauty from June to October.

In any case, it is certain that the Gladiolus, popular as it already is, has not yet reached the zenith of fashion's favour. Unlike most fashionable beauties, however, it is not merely a millionaire's choice, but because of the comparative cheapness of even the best-quality "glads," they are finding their way to gardens of every class.

Cheapness, as everyone knows, is a relative term. It is not cheap to buy an inferior article at any price. But in the case of Gladiolus, corms of the finest named varieties are within the power of most purses.

General Cultivation.—The oft-repeated formula of *deeply dug soil enriched with old, decayed manure* applies to the cultivation of Gladioli. They prefer soil that is of rather light, open texture, and if the natural soil is clay, sand should be liberally employed when planting is done. When flowers are grown in groups in the mixed border, it is best to take out with a spade a hole 6 in. deep. Dress sand over the exposed surface, nearly an inch deep if the soil is inclined to be sticky. Press the corms into this, leaving 6 in. between each. Then return the top soil, raking it level and marking with a label the position, variety, and size of the group, with the date of planting, thus: *Maiden's Blush* (6) *April 1st*. This gives data which is often worth recording in a garden diary for future reference.

Dealing with a reputable firm, one should have no risk of diseased corms, but if there is any doubt, soak the corm for two hours in a solution of 1-1000 of bichloride of mercury (i.e. $\frac{1}{2}$ oz. to 3 gallons of water) in a glass, earthenware or wooden vessel, and use sand freely when planting. New Zealand growers recommend the use of a solution of Formalin (see CHAPTER XVIII).

Exhibition Culture.—When growing Gladiolus for show, give weekly applications of liquid manure as soon as the flower spikes appear. The soil must be thoroughly wet when the manure is applied, and if rain has not fallen, water must be given freely the night before using the liquid manure.

Growing from Seed.—To grow from seeds is a form of gambling which most keen gardeners appreciate. Gladiolus seed is sown in the open ground in April, in drills 6 in. apart. $\frac{1}{2}$ in. of fine dry soil or sand is sifted over it. Young plants, looking like grass, will appear, and may be left to grow till autumn, when the tiny corms must be lifted and stored. They will be replanted in March and may bloom in the following summer. The "gamble" is appreciated when it is reflected that out of many

thousands of good seedlings there may be one which will be worth its weight in gold.

Hybridizing.—Amateurs seeking to produce new varieties by deliberate crossings may note the following:

The plants from which *pollen* is to be used should be of a *good distinct colour*.

The plants chosen as seed bearers should excel in *form*. The anthers of the seed bearers should be removed before they burst. The pollen of the chosen male plants should be carefully dusted on the pistil of the seed flower as soon as the anthers ripen.

A stud book should be kept, showing which varieties were thus crossed. When the seed ripens it should be carefully covered, *labelled* to correspond with the Stud Book, and kept dry till the following spring.

After Gladiolus have flowered, the spike is cut down and the plants left until the leaves have turned brown. The corms must be lifted, tied in bunches, labelled, and hung in a dry shed. If preferred, they are cleaned and stored in dry sand. Offsets, when present, can be planted *at once* in a prepared, well-drained bed of soil, over old manure, and left to grow for two years. These will, of course, unlike seedlings, be true to type, and should be labelled so that they can be used in colour grouping.

Greenhouse Cultivation.—Even the early-flowering gladioli, which need autumn planting, can be grown in the open with the assistance of a covering of straw or litter, or may have their winter quarters in a cold frame. But gladioli are also frequently grown in pots in the greenhouse.

They are potted in October or November in 6-in. pots, with five corms to the pot. A layer of crocks for drainage is put in, and the pot filled with a compost of one part loam to one part well-decayed manure and river sand. The corms are planted 1 in. deep in the soil and make fine pot plants. Light stakes are needed as the spikes develop.

Pests rarely trouble the Gladiolus—an occasional wireworm or other soil pest is treated with a soil fumigant. A watering of weak permanganate of potash over the soil at planting time is useful as a fungicide and insecticide combined. If dry-rot attacks the corms, they must be burned.

Recommended varieties for the novice are:

Primulinus:

ALICE TIPLADY. Orange-saffron.	ORANGE BRILLIANT. Bright orange.
CHARM. Rose-pink.	SCARLET BANNER. Rich scarlet.
EARLY MORN. Apricot-yellow.	GOLDEN GIRL. Golden-yellow.
MAIDEN'S BLUSH. Delicate pink.	

IRIS OR FLAG

Large-flowered :

BLERIOT. Apricot-rose.	DUCHESS OF YORK. Dark blue.
BRENCHLEYENSIS. Vermilion.	EMPRESS OF INDIA. Velvety maroon.
CATHERINE. Blue, lighted white, purple spot.	FLORA. Soft yellow.
CRIMSON GLOW. Rich crimson red.	PINK PERFECTION. Apple blossom, white stripe, rose border.

For Greenhouse cultivation :

<i>G. nanus group.</i>	<i>G. Colvillei group.</i>
PEACH BLOSSOM. Rose.	THE BRIDE. White.
BLUSHING BRIDE. Pale rose.	COLVILLEI ROSEUS. Pink.
CRIMSON QUEEN. Crimson.	TRISTIS. Yellow.
	ACKERMANNI. Orange-salmon.

Early-flowering plants for table decoration :

<i>G. Prinsianus varieties.</i>	BRILLIANT. Extra-glowing crimson.
ISHBEL. Soft, clear pink.	LASCELLES. Fine, delicate pink.
RED SPIRE. Deep red.	MINE BEAUTY. Cherry coloured.

IRIS or FLAG (Iridaceæ)

Iris, the lovely "Messenger of the Gods," has scattered the colours of her rainbow staircase "wherever the rainbow ends," be it lakeside or desert sand, rocky height or river valley.

In mediæval days superstition attributed to the roots the power to cure coughs, fits, snakebites, dropsy and anger; but flowers were still symbols, and Iris, the Fleur-de-lis of the French kings, was chosen as their symbol of adherence to the Christian faith.

Chemists still use the "Orris Root" for the sake of its faint violet perfume, and in Siberia and South Africa there are edible species.

The Iris, well named "the poor man's orchid," with its striking form and showy colouring, can be grown so freely and increases so rapidly, that it is one of the cheapest plants to cultivate. The family is grouped into two main divisions, the Bulbous and the Tuberous-rooted kinds.

The Bulbous-rooted Irises can be grown in sunny borders if planted September or October about 3-5 in. deep and 6 in. apart. They equally well adorn the deep pockets of the rock garden, or perhaps most satisfactorily flourish in the mixed border, where other foliage will hide their fading leaves when flowering time is over.

They can be left where they are, year after year, until over-crowding becomes acute. Weeding is the only attention necessary, as they stand well without staking. Most species are not too exacting in the matter of watering.

They are propagated by offsets removed in autumn.

Among bulbous-rooted Irises are Spanish (*I. Xiphium*), English (*I. xiphioides*), and Dutch Iris (a hybrid of *I. Xiphium*), and some of the winter-flowering Irises, e.g., *I. alata* and *I. tingitana*.

Pot Culture of Bulbous Irises.—Winter-flowering Irises, such as *I. tingitana* and *I. reticulata* can be cultivated in pots, as also can the Spanish and English groups. The soil should consist of equal parts of loam, leaf-mould and silver sand (not forgetting drainage). A cold frame is best until top growth appears, then a cool greenhouse; forcing is unprofitable.

Water treatment is important. The soil should be moist at the time of potting, and remain unwatered until growth has commenced. Then water is given fairly freely until the flowers fade, after which very sparing quantities are needed.

As the main object of these greenhouse varieties is to provide household beauty for winter months, it is convenient to note that *I. alata* and *I. reticulata*, the sweet scented, can both be grown for Christmas, though the latter needs forcing, as it is a March-flowering species outdoors. *I. pavonia*, the Peacock-flowered Iris, is another variety suitable for pot culture.

Of the hardy outdoor bulbous Irises, the following are useful for the home garden:

English Iris ("King of the Blues" and "White Lady"), *Dutch Iris*, *Spanish Iris* ("Gold Cup" and "Royal Blue"), *I. bucharica*, *I. juncea* and *I. sisyrinchium* (which favours stiff soil).

Japanese Irises (*I. Kaempferi*). Unlike the bulbous plants, the Japanese Irises are water-lovers, and are best suited to the sides of informal pools, or anywhere where the soil is rich, loamy, moist and boggy. They should be planted in October or March, and during the growing season they will flourish better with the help of frequent doses of liquid manure. A sunny spot is preferable to one with too much shade.

The Herbaceous or Rhizomatous Irises include (1) Bearded. (2) Beardless and (3) Cushion Irises.

Bearded Irises have their outer falls or petals beautifully crested. They are the popular JUNE IRISES (*I. germanica* and hybrids), and are easily reared. No other flower of equal beauty is so "foolproof," nor so easy to grow. Indeed, old gardeners sometimes say "let the man who cannot grow the Iris, stick to Aspidistras."

Propagation.—The bearded Iris is increased by pieces broken off the thick rootstock, together with a few of the fibrous roots, and replanted in any ordinary soil containing some lime. A position in full sunshine is needed. The rootstock loves to lie in the sun and bake, so

that the shallowest of planting is necessary, only the fibrous roots needing to be buried.

In breaking up the rootstock, choose the newest portions to replant, and see that each has its eye or growing point. Lift every two years as, with these prolific growers, overcrowding soon causes deterioration.

The Common Flag, is the best known of the Bearded Irises, but there are almost numberless hybrids now on the market which will repay a trial.

Beardless Irises. This group can be planted in October or March and prefers heavy rich soil usually, though some, such as the little American dwarf *I. verna* prefer an acid diet, and thrive best in a peaty loam.

A few, notably *I. sibirica*, *I. ochroleuca* and *I. pseudacorus* need moist soil, and are happy on the margins of ponds or streams, but a spot in the sun in either border or rockery is desirable for the majority. *Iris stylosa* (ungicularis), is grown out-doors most successfully under a south wall. In the cool greenhouse it blooms in mid-winter, and it will do the same in the open if the weather is mild. If not, it must be cut and brought indoors to open. A top dressing of gravel or chips is much appreciated in the damp days of winter.

Cushion Irises require more care and attention than other varieties. In a raised bed, against a South wall, prepare some light, rich loam mixed with mortar rubble. Plant in October, and protect the young plants with cloches or a cold frame during winter.

In July, lift the roots and store in dry sand in a warm shed or greenhouse until October, when they will be replanted. They are not so showy as bearded Irises, but are most interesting, and grow well in a bed made up of fertile river-sand.

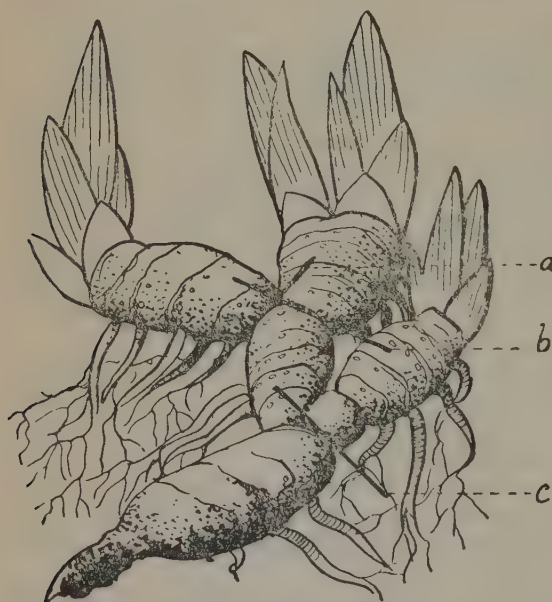
Seed Sowing.—Nearly all irises can be raised from seed sown in sandy soil in a cold frame, as soon as it is ripe. Sphagnum moss is laid over the sand to retain moisture while the seeds germinate.

The young shoots are fine like grass and transplanting is a work of care and patience. They may flower the second year but some kinds wait several years before they bloom.

Irises for specific purposes.—A landscape gardener working for a sweep of colour as seen from a distance, rather than for individual beauty of form and shading, will naturally choose his varieties accordingly. Depth and evenness of colour, and clean design, are to him very important. Japanese Irises fulfil these conditions exactly, giving a wonderfully solid surface of rich colour. And certain of the bearded Irises (*Othello* for instance), though insignificant seen as single specimens, are very impressive *en masse*.

COMPLETE GUIDE TO HOME GARDENS

Irises for the Rock Garden are of course very much smaller, and for this purpose the race of Dwarf Bearded Iris comes into its own. These plants flower with the early violet and primrose, and do not cease until mid-May. Most of the hybrids are derived from *I. pumila* and *I. chamæris*—they have a sweet fragrance and a wide range of colours from pale yellow to lilac, blue-purple and dark red. In height usually 4-9 in., and rapid spreaders, they are useful also as plants for the *Mixed Border*.



DIVIDING IRIS RHIZOMES.



READY FOR PLANTING

Tuberous or rhizomatous irises should be divided every few years. Replant the newer parts, leaving the rhizomes exposed and only the fibrous roots covered with soil

Some recommended species are:

I. cristata, lavender flowered. May. 3 in.

I. gracilipes, light blue touched with lilac. March. 6 in. (Shade from afternoon sun.)

I. reticulata, violet-purple, butterfly-like blossoms. 12 in. Very early flowering.

I. pumila alba, white and sulphur.

I. graminia, blue and fragrant. 1 ft.

For a terraced garden or top of a retaining wall, where it can be seen well, a curious little American Iris, *I. chrysophylla*, with no

IRIS OR FLAG

stem, but a perianth tube about 4 in. long, is most intriguing. It is veined maroon on a cream ground, and grows readily from seed. The Japanese Roof-Iris, *I. tectorum*, either blue or white variety is also suitable for the same position.

GEMS FOR SMALL GARDENS

Some of the new hybrids among Bearded Irises which are worthy of a place in the amateur's garden are as follows:

WHITE.

White Knight.

White Queen.

WHITE STANDARDS, COLOURED FALLS.

Blue Chintz.

Silverdale.

Rhein Nixe.

True Charm.

PURPLE BICOLORS.

Kharput.

Romola.

Lent A. Williamson.

Souvenir de Mme. Gaudichau.

Lord of June.

Sweet Lavender.

Majestic.

Zulu.

PURPLE SELFS.

Aphrodite.

Grey Lady.

Corrida.

Harmony.

Dog Rose.

Mars.

STANDARDS OF SHOT SHADES.

Alcazar.

Iris King.

Ambassadeur.

Lord Lambourne.

Bruno.

Evelyn Benson.

Cardinal.

Romance.

George Yeld.

Warrior.

VARIETIES WITH YELLOW STANDARDS AND COLOURED FALLS.

Flaming Sword.

Rialgar.

Fro.

Salonique.

Joan Curtis.

YELLOW VARIETIES.

Amber.

Kenya.

Daffodil.

Primrose.

Gold Imperial.

PRIMULAS

"A Primrose by the river's brim, a yellow primrose was to him, and it was nothing more."

But to the gardener it is a humble member of a "far-flung empire" of plants whose flags wave on Alps, Carpathians and Rockies; from Northern Siberia to Tibet and the Himalayas, over Japan and Burma, and throughout Europe and the British Isles; whose denizens are at home on mountain ledges, in wooded valleys, and by steaming bogs; and whose ways of living are so various that a lifetime's study can be given to it.

It is at first difficult to realize that the Irish Galligaskin or Jack-in-the-green (that curious primrose with a large Elizabethan ruff of leaves round its slender neck), the stiff early Victorian "Dusty Miller," and the Primula Bulleyana (Candelabra section) with free, light graceful heads of starry flowers, all belong to one family.

Primulas are grouped popularly as "Primrose," "Cowslip," "Polyanthus" and "Auricula." Those species, which belong to none of these four groups, are usually accorded their proper name of Primula.

Primroses.—This is the popular name for the common *P. vulgaris* which grows wild in our woods, and is the parent of a number of garden primroses, various in colour ranges. They include shades of pink, blue and mauve. The purple primrose *P. Sibthorpii*, which is a native of the Caucasus, is also thought to have contributed to the strain of garden hybrids, one of its probable descendants being a blue primrose with a yellow eye. This is of a generous habit—it flowers early and it flowers long, which makes it well worth a trial.

Other recommended varieties are: "Arthur de Moulin," like a Parma Violet; "Salmonea," soft rose; "Red Paddy," compact crimson; "Quaker's Bonnets," a double lilac; "Burgundy," clear purple; "Cloth of Gold," ragged, but lovely; "Madame de Pompadour," rich velvety red. Of the double class there are: The "Bonaccord Doubles" and the "Hose in Hose" varieties, "Lady Lettice" and "Ladies' Favourite." There are also the Double Polyanthus type represented by "Prince Silverwings," a blue-purple, silver-laced flower, "Curiosity," with three or four shades in one bloom, like coloured marble, and "Tortoisehell," a rosette flower of orange and terra-cotta.

Primroses flourish in many soils, but like well-manured ground (bone-meal and leaf-mould added to the ground before planting), a sufficiency of water, a certain amount of shade and sun, deep, firm planting, as they are inclined to work up out of the ground (a top dressing of leaf-mould at times will help to counteract this tendency), and the picking off of dead flowers. Roots should be divided every two years.

It is now recognized that the *Polyanthus*, so popular for spring bedding, is a cross between the Common Primrose and the Cowslip (*P. officinalis*).

PRIMULAS

Like the Primrose, it has of late developed a whole range of colours, but double forms in bunches on a stalk proved too heavy, and are no longer sought.

The best known and finest strain is the *Munstead* strain, of forty years ago, merely white and yellow, now in the whole range of primrose colours. It has almost ousted the old florist's Polyanthus, with its red or black petals, laced round the edges with gold, yellow eye, and other special markings.

The plants flourish in fairly moist soil and in partial shade. They are best divided every year. They can also be raised without difficulty from seed, and planted out 6-9 in. apart in July or August.

Almost all the remaining *Primulas* are looked upon as somewhat difficult to rear. This may be because they are foreign species that are unused to our climatic conditions. A plant from Siberia used to a long, cold winter rest, and a definite and steady change to heat and growth, is at a disadvantage in England, where spring days invade the winter months, and snow may fall even in June! Gardeners have to study the natural surroundings of any plant to make a success of its cultivation. Thus the rocky-ledge plant from the mountains would be put to the North side of a rockery, where the sun does not burn it, and the bog primula be set within easy reach of water.

There are, however, some general instructions as to propagation and cultivation that apply to the whole genus. As with many other plants, propagation may be effected in several ways: by seed, by root division, and by offsets. Seed is sown (a) indoors in pots and pans or (b) in the case of hardy *Primulas* such as the *Candelabra* and *Sikkimensis* groups, in a bed in the open, or in a cold frame.

INDOOR SOWING depends for its success on drainage, soil, method of sowing, and water. To secure good drainage there must be a drainage hole in pot or pan, and about a third of the pot space must be filled with broken crocks. Above this sphagnum moss or beech leaves are laid, to keep the drainage holes clear of soil. Above this is the soil, rough in the lower part and sifted to fine texture above.

The soil used is a compost of two parts good fibrous loam, two parts leaf-mould, and one part sand. It must be in such a condition as to form a ball when squeezed, but readily fall to pieces when touched or set down. The seeds must be sown *very thinly* and with only a fine layer of sand above them. Thickly-sown seedlings become spindly and weak, and if really well spaced, seedlings can be left undisturbed for much longer; a very important advantage.

It is better to water the soil after sowing, either by immersing the pot or pan in a basin of water up to the rim, and holding it there till percolation has taken place, or by watering with a fine-rosed can. Immersion

distributes the moisture more evenly and thoroughly, and is less disturbing to the seeds. When many seedlings are being raised, however, a fine rose will save much time.

After sowing, cover each pot with a pane of glass and a sheet of brown paper, or place in a frame or greenhouse. Wipe the glass every two or three days to remove moisture that has collected on the underside, and see that the soil does not become too dry.

OUTDOOR SOWING is much the same.

A 6-9 in. layer of ashes in the bottom of the frame for drainage, then a 6 in. layer of mossy fibre and a 5-6 in. deep layer of the compost. Firm the surface, and sow evenly and thinly, either in drills or broadcast. Cover lightly, water with a fine rose, and close and shade the frame till germination occurs. See that there is plenty of water supplied to keep the soil steadily moist, as most primulas like a damp soil.

The best time for sowing in a greenhouse is a few weeks after the seed has ripened at the end of the summer. This gives a larger percentage of germination than spring sowing, but Primulas are peculiar in that a number of the seeds remain dormant the first year, and appear the second spring after sowing. Hence, if germination is poor the first year, keep the seed pan as it is till the second!

For outdoor sowing March is the best month if a frame is being used, April if a shaded, open bed is made up. When seedlings appear, by gradual stages give light and air, never exposing them to full sunshine. Water regularly and watch for any sign of damping off. With the second pair of true leaves, seedlings are ready to be pricked out into boxes filled with the same compost as that in the seed bed. Disturb them as little as possible in the process and, unless they are tender varieties, put them out in the cold frame as soon as possible. They fail in warm greenhouse conditions, particularly in summer.

PROPAGATION BY DIVISION is easy, common, does not require much space, and ensures identical reproduction in colour, size and habit, but it is only possible when there are several crowns to one root system.

All perennial Primulas, including Polyanthus, Cowslips, and the common Primrose, which form several crowns or growing points, can be readily increased by division, but there are a few which, like *P. Littoniana* and others in the *Muscarioides* section, do not form more than one growing point, and there are also some woody-stemmed species whose crowns are too firmly attached to be successfully separated.

Method of Division.—(1) Carefully lift the whole plant. (2) Either cut or break each crown gently from the main stock, bringing away with it a few roots. (3) Replant each crown separately. First make a good-sized hole, so that there is plenty of room for the roots; make the ground firm round it and water well. Shade with fir or spruce

PRIMULAS

branches or some light covering, and water every day to keep the plant from withering. The plant should be well established before the winter frosts, hence July or August should be chosen for division, and preferably a damp day. Plants thrive better if moved into damp, warm quarters, and roots are still active at that time of the year.

PROPAGATION BY OFFSET is only advisable with plants of a branching habit where several offsets are made from one rootstock, such as in the *Primula auricula* and *Primula marginata* and their varieties.

In that case each offset is broken off with a heel in July, placed in a small pot of sandy loam and set deep in ashes or fibre in a propagating frame. Some Primulas, the Candelabra and Cortusoides sections particularly, have a unique habit of growing leaves on the lower tier of the flower stem, particularly if they are growing in shade, and in a rich soil. If the flowering top is cut off, the leaves develop, and aerial roots appear from the base of the tuft. The tuft should then be cut and potted up firmly, where it will readily establish itself as a new plant. This is called *pelorial growth*. Plants formed thus are ready for planting out in May.

GENERAL CULTIVATION.—A good loam, with a little sand if it is heavy, or a little peat if it is poor, generally suits Primulas. Chalk is very frequently disliked by them, and a freshly limed soil is always risky. The ordinary primrose and polyanthus, however, suffer no ill effect from lime. A little peat moss litter may be useful. Larger growing types may benefit by an occasional surface mulch of well-rotted manure, and Primulas in pots may require a little charcoal to prevent sourness of the soil. All Primulas need plenty of water in summer, but in winter they resent excess, and can never flourish unless thoroughly good drainage removes all stagnant moisture from the soil. Hence with a clay subsoil it is well to have a crock drainage, *i.e.* brick and broken clinkers, 16 or 20-in. deep, below the top 10 in. If the top soil itself is heavy, it may be lightened with gravel or sharp sand. Some Primulas even then show signs of winter rotting, and for them a protecting glass or overhanging stone is an advantage. The crowns must be examined after the frost, as they may need to be replanted firmly.

In summer, frequent hoeing, which conserves the water in the subsoil, will keep the ground cool and moist for the roots, and in long periods of drought, thorough watering to moisten the subsoil is essential. With regard to sunshine, about two hours a day on an average suits most Primulas, hence a westerly garden does better than a southerly, and wherever possible they should have dappled shade and sunshine, as in the shade of a Birch tree.

At the same time it might be noticed that the European groups of primulas are more prone to appreciate sun, while the Asiatic like a cool,

moist soil and more shade. *The Asiatic Group* includes the well-known cabbage-like plants of the *Primula japonica*, with purple-red flowers opening in June, the spike-flowered *Primula libboniana* with brilliant scarlet bracts and pale violet flowers, opening in August, *Primula muscarioides*, a Chinese species, whose purple blue flowers resemble Grape Hyacinths in growth. *Primula sikkimensis*, loose heads of scented yellow bells on powdered stems (reaches perfection at the bogside); and *Primula Winteri*, large fringed lilac flowers, needs a cleft in a rockery where its roots can reach rich, moist, well-drained soil. This plant was found in the Himalayan heights by Captain Winter.

Of the *European Group* some good varieties are: *Primula Allionii*, a native of the Maritime Alps, with lovely pink flowers and small, sticky leaves (this should be firmly wedged in limestone soil, perfectly drained, and is propagated by pieces pulled off the crown); *Primula Juliae*, wine-red, stemless flowers, very easily cultivated. The parent, in conjunction with the Common Primrose, of many profusely-flowering, longer-stalked hybrids; *Primula marginata*, lavender blue, leathery-leaved rosettes, easy to cultivate if planted in chinks and fissures of the rock garden, and not on the flat.

Primula Auricula.—For 200 years this son of the “Bear’s Ear” of the European Alps has been grown in our English gardens, but it was not till working men of the north took up its culture, and the Auricula and Primula Societies were formed, that it attained its modern popularity. The original Alpine Auricula is a European plant with mealy leaves arranged in a rosette, and large heads of mealy-throated, golden-yellow flowers.

From this have been evolved varieties and hybrids in such numbers as to be impossible to include them, but there is no doubt that the old-fashioned Dusty Miller is a true descendant of the family, and its wine-red blossoms and broad white centre ring are still beloved of the cottage garden. Modern classification separates Auriculas into Alpine Auriculas, Show Auriculas, Selfs and Fancies, the three last being grown as pot plants in a cool house, while Alpine Auriculas find a home on the rock garden.

Alpine Auriculas are more vigorous than the greenhouse Show plants, and are not mealy. Thrum-eyed flowers, *i.e.* those whose anthers are high in the tube, are considered the best to grow. They will grow in any good garden soil, but repay culture in a good compost of loam, well-decayed manure, leaf-mould and sand.

Show Auriculas are green edged, white edged or grey edged. In the green edged, the flower is absolutely circular, the green rich and striking petals smooth edged, with the truss of bloom borne on a stout stalk. In the centre is a yellow eye, while inside the flower is a sort of paste of meal.

like matter known as farina. In the white-edged, the farina closely covers the outside edge and completely hides the green, while the grey-edged varieties have edges but partially covered with the white meal, and so are dusty.

Selfs are a class in which body colour is carried through without any change, from the paste to the edge of the petal. They have naturally a thinner texture, but are frequently very lovely flowers.

Fancies mingle the characteristics of the groups, and are most popular among Auricula "fans," who raise them from seed. Show Auricula and Fancy alike frequently have "snow-powdered" foliage with a silver edge, which adds to the quaintness of the whole plant.

PESTS AND TROUBLES.—*Frosts* will not harm Auriculas though it may spoil the bloom; *damp* during autumn and winter is their most deadly enemy. Hence no drip must be tolerated in the frames and no water must ever lodge in the heart of the plant. The pots need edge watering, not rose spraying.

If *rot* should attack the root, cut away the affected part and apply a little powdered charcoal. This generally induces recovery.

Green-fly above ground and *Woolly Aphis* underground are the Auricula's chief pests. The Woolly Aphis attacks the roots and collar, and while fumigation may *kill* both, the plant may need to be dipped in insecticide to get rid of the aphides.

PROPAGATION.—The grower seeking for a "new variety" must be careful to cross-fertilize from other plants of the same type, *e.g.* green edged with green edged, not with grey or fancy. Perfect blooms will then often be obtained.

Method of Cross-fertilization.—Remove the anthers from the flower selected as seedbearer, before the pollen is ripe. When the flower is fully open, dust the pollen from the other chosen flower on to the stigma.

The seed will ripen in July and can be sown at once, or in the spring. When it will germinate is another matter! Often seeds lie dormant for one or even two years, but patience will be rewarded in time, and as soon as the seedlings are large enough to handle they must be potted, using the compost recommended above for Alpine Auriculas, first singly into small pots, then larger as required. They should bloom in a 5-in. pot.

Another Method of Propagation is by taking offsets in February, those already rooted being planted in 3-in. pots with a little fibrous peat added to the compost. Those without roots soon form them if placed round the edge of pots. They will need more water in March, but must not be sodden, and need only be kept just above frost temperature. In April some protection from midday sun will be needed and abundance of air. The blooms then develop and may require support. The plants go out of bloom in May, and re-potting commences. During summer keep the

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plants clean, cool, and well drained. In September, exposure to air on all favourable occasions will strengthen the plants for the following year, and off-shoots should be removed.

The secrets of success are:

- (1) A sweet, wholesome compost.
- (2) No stimulant, no artificial manures, no liquid
- (3) Utmost cleanliness.
- (4) Common sense about watering. Plants must never get dust-dry nor sodden.
- (5) No coddling.

A few recommended standard varieties are:

Green edged.—Abbe Liszt, Henry Wilson, Diomed, Shirley Hibberd, Mrs. Henwood, Champion.

Grey edged.—George Lightbody, Sherwood, Olympus, Richard Headley, Robert Traill, William Brockbank.

White edged.—Catherine, Smiling Beauty, Frank, Heather Bell, Ann Smith.

Selfs.—Andrew Miller, Mikado, Pizarro, Metropolitan, Ruby, Victor.

Alpines.—Phyllis Douglas, Argus, Dazzle, Brightness, Duke of York, Golden Dustman, Janet.

PRIMULAS IN THE GREENHOUSE

Greenhouse Primulas are either biennial or perennial, but are all treated as biennials to ensure a stronger habit and finer flowers. Their height is from 9 to 15 in. They are perfectly easy in culture, and make admirable pot plants for room decoration.

Some of the best for the amateur's greenhouse are: *Primula Sinensis*, of which the giant varieties are very showy—"Giant Pink," "Queen Alexander" (Giant White), "Giant Emperor" (terra cotta, cerise) "Giant Salmon," and the giant hybrids. Other good varieties are: "True Blue," "Red," "Crimson King," "Brooke's White," "Czar" (violet blue), "Double White" and "Double Pink."

Primula stellata is another form of *P. sinensis*. This can also be obtained in Blue, Crimson, Salmon, Coral Pink, and White. These plants are rather taller, the flowers smaller and more numerous, and they require more heat and care. Seeds are sown in spring for winter, and July for spring blooms.

Sow in shaded pans, with light soil, and cover with moist moss to keep even moisture. Prick out into 3-in. pots when several leaves have been made. Use a compost of turfy loam, leaf-mould, and sand with a very little decayed manure and broken mortar rubble in it. Final pots should be 5-in. Soil should be turfy loam, leaf-mould and sand, enriched

with old manure from last year's cucumber bed, and a sprinkling of complete fertilizer. A sprinkling of mortar rubble should be crushed over the soil before mixing, good drainage and always *rough* leaf-mould over the crocks. Water at the side of pot.

Primula obconica is easier to grow as it requires less heat, but to some people the leaves are poisonous. The poison affects the skin wherever it has touched. Fortunately this is only a minority, and most people can handle them with safety.

(An easy remedy for the trouble is to wash with turpentine or use zinc or boracic ointment.)

Varieties.—"Giant Sky Blue," "Giant Rose Queen" (rosy carmine), "Eureka Salmon Pink," "Giant White." Seed is sown in July for spring blossoming, and soil is as recommended for *P. sinensis*. *P. obconica* can be grown throughout in a cold frame if desired.

Primula malacoides, the seeds of which are sown in August. Otherwise treatment is as for *P. sinensis*. Its flowers are graceful and dainty. The more robust varieties are "Pink Beauty," "Eclipse," "Carmine Pink," "Princess Patricia," and "Snow Queen."

Primula Kewensis has a sweetly-scented yellow flower growing in whorls. Soil and cultivation are as for *P. obconica*.

RHODODENDRONS (*Ericaceæ*)

Travellers to the realms of the Rhododendrons go hand in hand with Gulliver. At one time they wander lost among the giant Brobdingnagians of Burma, tree species 100 ft. high, and in their season, covered with masses of brilliant and enormous flowers; at another they stride valiantly over hosts of Lilliputians, little 6-in. plants that blossom out into a sea of colour on the moorlands of lofty mountains in East China.

Between these extremes lies an immense variety of size, and colour. Every tint from deep purple and lavender blue through all the shades of red, orange and yellow to creamy white is pressed into service, and almost every type of woody-stemmed plant, from the tree to the almost prostrate shrub. Rhododendrons have an independent spirit, however, and refuse to be climbers. Their distribution is as various as their height and colour. Across the whole stretch of Europe and Asia, reaching down through Malaya into Northern Australia and westward across the United States, they are found. Only in South America, Africa and New Zealand are there none.

For convenience in dealing with so unwieldy a mass of varieties, they have been roughly grouped, partly according to districts and partly according to habitats. Dwarf plants belong to *Lapponicum*, *Cephalanthum* and *Neriflorum* series, while the giants are of the *Stamineums*, and between them come the *Fortunei*, the *Irroratums* and the *Maddens*, etc.

The *Ponticumis*, originated in Asia Minor, Spain and Portugal, and the deciduous section is largely American.

Characteristics of Rhododendrons.—Though mainly evergreens, true winter buds appear. The leaves are smooth edged, leathery, shiny above, sometimes hairy and sometimes scaly underneath, and arranged in rosette form at the ends of the shoots. They are sometimes aromatic.

The flowers are in trusses at the ends of the flower stalks, and are bell or funnel shaped generally, and 5 lobed with 10 stamens. The seeds are small, numerous and winged, and are set free by the splitting of the capsule into five sections.

Massed in great bunches, these loose trusses of flowers, seen in a woodland glade or on a terraced lawn, are strikingly handsome. Why, then, do we not all grow Rhododendrons in our own gardens?

Soil.—The first reason is probably that they are plants of strong likes and dislikes—chalk and lime are their pet abominations, and a soil rich in humus or peat, with a base of sand, is what they require. The second reason is expense. A good plant near its flowering time will cost from 5s. or 7s. 6d. to a guinea.

Moreover, should the poor man decide on seedlings to suit his pocket, he will need much patience—for Rhododendrons do not flower till they are three years old, and may not till they are twenty! At the same time, if *one* plant is purchased the owner can produce many others, in course of time, by the familiar process of layering—so that the investment is not so unprofitable as it appears at first sight.

For the slender purse, it is well to avoid any varieties of *stamineum*, *arboreum*, *vaccinoides*, *Maddenii* and *brachyanthums*. They are difficult to rear, and die more readily.

The old complaint that the flowering period was so short is dying out now that the new hybrids flower younger, and continue their flowering period for so much longer. But at present many of these plants go very shabby all the winter, their leaves curl and look dusty and weather stained. To this some tidy-minded gardeners take exception.

Cultivation.—Rhododendrons can be planted in open weather any time from October to May and grow well in good loamy soil with leaf-mould and plenty of sand if no lime is present. They certainly like peat—but can do without it. Sand, however, is very important, as it secures aeration of the soil, and allows for the proper functioning of the bacteria on which the health of the Rhododendron depends.

The more silicate the sand contains, the better for the plants—but there must be no lime or chalk—even the water used must be “soft water.” Shallow planting and firm planting are both essential, and a layer of leaf-mould for the roots to rest on is beneficial. Rhododendron roots are continually coming to the surface, and the grower must remedy

RHODODENDRONS

this with an annual top dressing of $\frac{1}{2}$ in., not more, of leaf-mould to keep the roots cool and moist, to afford some nourishment, and to keep off ground draughts.

Propagation.—Cuttings may be taken in September of the current season's wood with a heel attached. They should be firmly planted in a frame containing a mixture of 3 parts sand to 1 part leaf-mould. They should be in a sunny part of the garden, but should be kept close and shaded till mid October, when the shade is removed. The cuttings may be sprinkled with water on fine days. The frame is kept close till spring when the cuttings are rooted into richer soil.

Layers may be encouraged—some Rhododendrons root their lower branches naturally—and these may be in twelve months time separated from the parent. This is often a better way for the amateur to increase his stock than by cuttings.

Seeds are a ready means of increase, as well as of hybridization. It is best to sow in granulated peat moss and sand, as there is less damping off, less watering is needed and no weeds grow. The boxes are well and cleanly crocked, the peat moss laid over a compost of sand, loam and leaf-mould, and well pressed down, the seeds sown thinly, and not covered. The boxes are covered with glass, shaded with paper, and, in a month, germination should take place.

A little ventilation, and the turning over of the glass, are then needed. When the second pair of leaves come, a little more raising of the glass is required. In due time the seedlings are pricked out into pans of very sandy soil, and eventually into the open ground.

The majority of Rhododendrons like a position in open sunny borders, or in shrubberies where slight shade relieves the sunlight. Many show to best advantage with a dark background of trees. It is usually a mistake to plant them on a slope, but a grassy terrace sets them off to advantage, and the dwarf kinds make gay little rockery plants.

As soon as the flowers fade, seed pods should be removed; other pruning is not necessary, except in cases of overgrown bushes.

Rhododendrons are singularly free from disease, and the Rhododendron fly, Rhododendron beetle and White fly are seldom very serious, and are easily controlled by fumigation or spraying.

Included in the genus are the *Azaleas* which differ from other Rhododendrons mainly in the glory of their autumn foliage, which is shed before the frosts. They are also more brilliant in colour than the Rhododendrons.

Linking the two groups are the *Azaleodendrons*, hardy hybrids, and mainly evergreen, and it is by the judicious mingling of the different groups according to their colour and flowering time that lovers of the Rhododendron can secure a long-continued series of bloom. Amid such a multiplicity of choice, it is advisable to consult the catalogue and the

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nurseryman if planting in any quantity. For the moderate sized garden, one variety that never seems to fail, in sun or shade, country or town, is Pink Pearl, and for the rock gardener the little dark crimson flowers and low creeping habit of *R. Forrestii*, one of the *Neriflorum* series, is perfection. For a more spacious habitat a masterpiece of the breeder's art is *R. Loderi*, with deliciously scented shell-pink flowers, each 6 in. across, massed together in trusses of nine or eleven, and making a magnificent natural bouquet.

A few other good showy varieties recommended for small gardens are:

Early Flowering:

ASCOT BRILLIANT. Deep blood-red. PRÆCOX. Lilac.
JACKSONI. Soft pink.

Dwarf:

MULTIFLORUM COMPACTUM. Blush pink.	CANTABILE. Violet blue.
BROUGHTONII AUREA. Bronze yellow.	DICHROANTHUM. Deep orange.
WILSONI. Rosy purple.	APODECTUM. Crimson.

Midsummer-Flowering Varieties:

BAGSHOT RUBY. Blood crimson.	PURPLE SPLENDOUR. Deep purple.
CORONA. Coral pink.	LODERI. Pale shell pink.
PINK PEARL. Rose pink.	

Late-Flowering Varieties:

Discolour	{	ASCOT BRILLIANT. Pink.
		SAPHO. While and pale lilac.
		IVORIANUM. Shades of rose.
		MRS. R. G. SHAW. Blush shades with conspicuous crimson eye.

Pot Plants.—The brilliant flowered Azaleas are often grown in the greenhouse for early flowering and are sweet scented. Of these the following can be recommended to the owners of cold greenhouses:

R. auriculatum.
R. odoratum.
Azalea pontica.
A. viscosum.

SWEET PEA (*Lathyrus odoratus*). **Leguminosæ**

Considering that peas have been grown in the East for thousands of years, it is somewhat remarkable that the Sweet Pea, prime favourite as it is now, was only brought to Britain from its native home in Sicily about two hundred years ago.

Stranger still is it that so few years back, within the memory of living gardeners, there was but one variety obtainable—the old small-flowered blue-purple sweet peas, loved rather for their fragrance than for colour or form.

Among the multiplicity of new colours and the elegance of new contours the Sweet Pea has mislaid only a little of the scent which was its early charm; the finest modern varieties give almost as much, if not quite as much fragrance in the garden and the vases. The Sweet Pea is so well known that it requires no description.

General Cultivation.—Methods of cultivation depend somewhat on whether Sweet Peas are wanted for the vase, for the beautification of the garden, or for exhibition.

Soil preparation must be thorough for cut flowers and garden decoration alike, if the best results are to be obtained. The first step is vigorous use of the spade in autumn. A deep trench should be dug, and well manured. If the soil is light, decomposed farmyard manure, or rotted garden refuse is the best addition. On heavy soils, strawy stable-manure is better, and dried leaves may be collected in the trench and dug in during the winter. Lime is essential in all cases.

Methods of Sowing.—The simplest method, and that used frequently for cut-flower production, is to sow in a double row in March or April. Drills are drawn five inches apart and two inches deep (evenness being secured by the use of pegs, between which strings are stretched to mark the line required). In the bottom of the drills scatter a little soot.

Drop seeds two inches apart along each drill, cover, and tread the soil firmly over them. Then rake lightly, both for appearance and to give a friable top surface for the conservation of moisture.

Finally, dust soot over the surface. This discourages the unwelcome attention of snails and slugs.

In districts where cats are few, and mice abound, growers find it useful first to soak the seed in paraffin, and then to dust it over with red lead, to prevent it being eaten as soon as sown.

If packets of seed are bought, each of a separate colour, it is best to sow all one colour together, and to contrast the colours in rows or half rows. Mixed Sweet Peas are seldom as satisfactory as separate colours, either for house decoration, or for the garden borders, and beginners

would do best to use a collection of distinct colours; colours such as; Model, white; Fireglow, rose red; Flamingo, scarlet; Charming, cerise: Reflection, pale amethyst blue; Youth, white, edged rose; Elizabeth, lilac-pink on cream; The Flag Lieutenant, violet blue; Dainty Maid, blush pink; Olympia, purple.

These would give a wide colour-range from which vases could be filled to suit any room.

When seedlings appear, put in a few small feathery twigs. These will slightly protect seedlings from wind, and provide a temporary hold for the tiny tendrils. As soon as the plants become well developed, provide a row of strong twiggy pea-sticks between the two drills. The flowers will eventually clothe both sides of them.

Hoe the surface in dry weather, but not too near the plants or the roots may be damaged.

Further protection is given by a mulch of spent hops, which in dry weather helps to retain moisture.

Finally, remove dead flowers without delay. Cut with as long stalks as possible and cut liberally. The plants respond to this with liberal growth.

For Garden Decoration.—Sowing varies according to the position of the garden as regards shelter and sunshine and the condition of the soil. In a sheltered garden, with warm light, loamy soil, September sowings can be made in the open ground. On cold clayey soil, or in exposed situations, it is wiser to sow in pots or boxes and leave the seedlings in the cold frame till March.

These sowings may be made in autumn or in January or February, as convenient. Autumn-sown seed usually results in earlier flowering, and plants are sturdier raised in a cold frame than in a heated greenhouse. When the young seedlings show their second or third pair of leaves, in spring, pinch out the centre tip and leave the plants till the side shoots begin to grow. Then pot them singly into small pots, filled with a mixture of old loam and leaf-mould and a little sand.

Stand these pots in the frame and as soon as possible admit air freely, except on frosty nights. This should cause strong, hardy plants to develop very quickly, and April should see them in good condition for planting out.

Soil which was well-manured in winter will need little preparation beyond forking, but a few handfuls of bonemeal may be forked in, if desired.

Where clumps of Sweet Peas are to form part of the mixed border, dig a hole two feet in diameter and eighteen inches deep. Roughly fork in a handful of bonemeal at the bottom of the hole. Add a three-

SWEET PEAS

inch layer of well-decayed manure, and fill in the ordinary soil. Leave this to settle for a fortnight before planting.

Planting in Clumps.—As a preliminary put a stout stake into the middle of the prepared ground. Turn out about a dozen plants, with the soil intact, from the pots. Remove the drainage crocks and plant the seedlings in a circle round the stake. At the same time, push in tall branched pea-sticks on the inner side of the plant circle, at intervals, and tie them with raffia to the centre stake. This ensures firmness, and later makes an excellent show stand for the dainty blooms.

Failing pea-sticks, wire-netting can be formed into a circular stand, but it is stiffer and less pleasing in appearance. Soon after planting, put in a few small feathery twigs to lead up to the pea-sticks. The young tendrils should curl naturally round these; if not, they can be gently trained at first.

A ring of lime and soot round each cluster of plants keeps off slugs, and a judicious use of black cotton on the twigs above the seedlings scares the birds.

Young Spruce trees are utilized as supports for the Sweet Peas with great decorative effect. Their trunks are cut off to a height of about 10 ft., and the trees used are 4-5 in. in diameter at the bottom. The side branches are cut back to within 1 ft. of the stem, and all brushwood trimmed from the remaining portions.

All the branches are cut away completely from the bottom 2 ft., to allow the trunk to be set firmly, 2 ft. deep, in soil. This lower portion is charred to prevent rotting. Such supports last for some years, and are worth the trouble of preparation because of their decorative quality.

Colour Tones.—An effective display is made if each clump of Sweet Peas is planted with *shadings of one colour tone*. Thus, in one clump might be planted the peach-pink "Debutante" and salmon-orange "Smiles," with the slightly pinker "Mrs. A. Searles," or alternatively, with the deeper tones of "Orange Flame." Another clump could consist of the deep violet blue of "Fortune," the bronzy blue of "Flag Lieutenant," the mid-blue of "Amethyst," and the paler tone of "Blue Belle."

A study of the trade catalogues will suggest other colour combinations in the shades favoured by the individual grower.

EXHIBITION BLOOMS

"How do they do it?" says the envious amateur, eyeing the fine Show specimens. And the gardener—in agreement with Napoleon's dictum, "An army marches on its stomach"—says "Manure!" "And what else?" "More manure!"

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Deep digging and adequate feeding of the soil are the essentials for success.

Cultivation begins in October or at the latest before Christmas. Open out a trench 3 ft. wide and 2 ft. deep, preferably running North and

SWEET PEAS FOR EXHIBITION



CORDON
TRAINED.



A GOOD SPRAY.

For exhibition purposes, Sweet Peas should be trained to individual supports so that each plant has ample room for development

South. Throw the top foot of soil on one side of the trench, the second foot on the other side.

Scatter into the trench 4 oz. of crushed bone, or bonemeal, to each yard, and fork it in.

Next put in a layer, 3-4 in. deep, of stable manure if the soil is heavy, or cow or pig manure if it is light. Then throw back and mix with the manure the top spit of soil from the one side of the trench.

Spread a second layer of manure and mix with it the soil of the bottom spit from the other side of the trench. Leave a really rough surface so

SWEET PEAS

that rain, frost and air can act on the soil. Dress the trench with lime and leave it to weather for the remainder of the winter. In the spring the top soil will have broken down to a fine texture.

DO NOT GRUDGE SEED COSTS

Good seed perfectly ripened and true to name is worth the price asked for it. Cheap seed is a more than doubtful bargain, and certainly useless for exhibition work.

Some growers chip the seed (specially the dark-seeded varieties), to hasten germination, but this is unnecessary. If the frames are kept rather close and very careful watering given, every seed sown will germinate. A rather large proportion of sand in the compost will prevent rotting before germination, which occurs sometimes in cold, damp weather.

Time to Sow.—For Shows that take place in June and July seed must be sown in late September or early October in a cold frame or greenhouse.

Soil should be a mixture of loam, leaf-mould and sand. The soil from an old cucumber or marrow bed is good, if available.

Seeds are sown in pots or boxes and kept in a cold frame with the lights closed day and night, until the green seedlings appear. Then the lights may be taken off altogether, except in bad weather (*i.e.* wet or frosty). Even when the lights are necessarily replaced air must be admitted, as if the seedlings are coddled at this stage they will never be sturdy, and the flowers will not be up to exhibition standard.

Wire netting over the frame will prevent birds damaging the plants.

On the appearance of the third pair of leaves, pinch out the tips. Leave the plants in the frame till the side growths are half an inch long, and limit the side growths to one or two according to the variety of the seed.

If sown in boxes, the seedlings must now be potted singly into small pots, with good compost, but no artificial manure.

Stand the pots in the cold frame again, giving air in the day, but closing at night, until plants are well established. After this they are quite hardy and will stand up to 8 degrees of frost, so long as the sun does not reach the foliage while it is still frosted. If they are at any time severely frosted, sprinkle the plants with cold water *before the sun reaches them*.

Wintering Seedlings.—Autumn-sown plants are better plunged 2 in. in deep sand or ashes, and given a minimum of water during the winter. There are special seed-raising boxes now sold which make transplanting easy, and safe for the roots. These are used by many

amateurs, particularly where space is limited, as their square shape allows of close packing.

Planting Out.—The second week of March is the accepted date for planting out, but delay may be necessary in some districts and the grower must be governed by the condition of the seedlings, and of the soil in the trenches. Surface soil if at all lumpy should be well broken up, and a good dressing of wood ashes or soot forked lightly into the top layer of the trench will be beneficial.

Staking.—Bamboo canes are best for supporting Exhibition plants—which must from now on be robbed of their tendrils. The method adopted for the use of bamboos is as follows:—8 ft. poles are erected 15 ft. apart, in the centre of the trench, with cross pieces of wood 1 ft. long, nailed firmly at the top, middle, and about 3 in. from the ground; three wires are strained tightly from end to end, fixing them to the ends of the wood cross pieces with small staples. Canes are tied 6 in. apart along the wires with the ends just resting on the earth. (If they merely rest in this way, they will last for years—whereas driven into the soil they rot.)

Set the plants out 6 in. apart along the centre of the trench; make the holes with a trowel or hand fork and disturb the roots as little as possible, in planting.

Hold the plants so that the top of the soil that was in the pot is now 2 in. below the level of the ground. Make the soil very firm round the plants but leave the surface loose and friable.

Keep each variety separate, and labelled as it is planted.

Plants that have two stems (i.e. the most vigorous varieties), are planted between two canes so that each stem can be trained up separately. A single-stemmed plant (of a weaker variety) is put as near a cane as possible.

Spring showers generally relieve the gardener of the need to water, but should dry spells occur, freshly-planted rows may need the watering-can.

Growth will be slow at first, but when the plants do begin to climb they must be carefully tied to the canes. They will also need attention two or three times a week, to remove side growths and tendrils, and to continue tying to the supports as required. Hoe the surface near the plants frequently in dry weather, but do not hoe near enough to damage the roots. After May, a mulch of spent hops, or well-rotted manure, may be put along the surface between the rows, and hand weeding must then take the place of the hoe.

As soon as flower buds appear on the crowns of the plants, artificial feeding may commence. A weak solution of soot-water once a week, and then an alternate supply of liquid manure diluted to the colour of

SWEET PEAS

weak tea, will be enough for a few weeks. Plants should not be allowed to bloom until they are at least 3 ft. high, but can then be allowed to produce freely through the summer. Allow no seeding—cut dead flowers away at once, and give occasional doses of fertilizer to keep up the supply and quality of the blooms.

EXHIBITION CULTURE UNDER GLASS

Sweet Peas are cultivated under glass for two purposes—to obtain an early crop—or to ensure a clean crop for exhibition. In either case the grower can utilize the same glass structure for a following crop of tomatoes, and complete the annual cycle with winter-flowering chrysanthemums.

Seeds can be sown in boxes in the last week in September and given the same treatment as plants intended for the garden. Potting soil consists of good turfy loam, well-decayed old manure, and a little sharp sand, all put through a sieve. Pot into 3-in. pots. Strong varieties allowed two stems, will be planted two in a pot. Weaker varieties allowed only one stem to each seedling are put four in a pot. When the roots are filling the small pots, move the plants into 5-in. pots, well drained, and with the same mixture of soil. Press the compost well down round the sides of the pot, and give a good watering before moving to the cool greenhouse. Plenty of ventilation is required and careful watering. The plants will be ready for 10-12-in. pots when the roots begin to run round the 5-in. ones. This can be discovered by tipping out one of the pots to investigate.

This final potting requires a richer soil. Three barrowloads of loam, one of decayed manure, a 7-in. potful of bone-meal, the same quantity of dry soot, and some finely crushed lime-rubble or sand are the ingredients which need careful mixing.

The pots, too, require special treatment. The hole at the bottom must be increased to 3-4 in. To do this invert the pot over a solid block of wood and chip away at the edge of the hole with a small hammer. Each pot must be scrubbed clean and well dried before use.

The drainage hole must be covered with clean broken crocks placed concave side downwards. Put about 3 in. of the roughest of the soil into the bottom of the pot, making it quite firm. Now tip the plants out of the 5-in pot, remove the crocks from the bottom of the ball of soil, place it carefully in the middle of the 10-in. pot, adding more soil to make the whole quite firm. Fill to within $1\frac{1}{2}$ in. of the rim of the pot.

Soak with water, and stand in the cold greenhouse for three weeks; then give all the light and air possible.

Trenches are then prepared in the greenhouse, 18 in. wide and 18 in.

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ng a layer of old manure, mixed with crushed bones and soot, om, and two inches of good soil to level off the surface and make e for the pots. About the second week in February these will position slightly apart from each other and with soil packed well round and between them, leaving no hollow space. With their rims $1\frac{1}{2}$ in. below the normal level of the ground in the trench, they are less likely to suffer from lack of water. The pots may need occasional watering and when they do should be well soaked, but the trench will not want watering for some weeks. Surplus water will drain down to the bottom of the trench and will be useful in attracting the roots to the bottom of the pot.

Canes supporting the plants will be tied to a stretched wire running along each side of the trench, as recommended for outdoor growth. The four stems from each pot will be trained two to each side, to four separate canes.

Ventilate plentifully but avoid draughts. On a windy day the windy side of the house should be closed.

When plants have grown to the top of the canes, i.e. within 12 in. of the glass, they must be loosened and retied, bent round in a more or less circular form to bring their tops lower on the cane and allow for further growth, so that the crowns shall not be over-crowded when the flowers appear.

Doses of soot-water during the flowering period improve the colour and the plants should be kept well fed and watered.

Orange and salmon varieties will need shading to preserve the tone of their colouring.

Trenches under Glass.—Sweet peas can be grown in the trenches under glass instead of in pots; seedlings are raised in the cold frame, and are given hardy treatment.

In January they are brought into the greenhouse and put close to the glass in a temperature of about 50° for about three weeks.

The trenches are prepared as before, but with the addition of a layer of manure to the soil, and are well soaked three days before planting is done. After-treatment corresponds with that for pot plants.

Pots without Trenches (for decoration only).—The difference in treatment between these and exhibition plants is that the pots are set on a shelf. Four 5-ft. canes are pushed into each pot about 1 in. from the rim, and parallel with the sides of the pot. Raffia tied round the canes provides support. Water is given as required but not to excess.

When the pots become crowded with roots a little liquid manure is given each week, and instead of a top dressing each pot is stood in a larger pan filled with old well-rotted manure.

Should the stalks shorten, or quality deteriorate, a little stimulant

VIOLAS AND PANSIES

in the form of 1 oz. of nitrate of soda dissolved in 4 gallons of water will usually restore the condition of the plants.

Exhibition Hints when Staging for a Show.—Cut in the cool of the evening when the flowers are dry; stand them in water in a cool shed or cellar all night or for at least six hours. Choose blooms on the young side, with as long stems as possible—the two top blooms should not be fully open.

While in water let the flowers stand loose in the jar so that air circulates between them. Dry them a little before packing, rolling about 24 sprays into a bunch packed in tissue paper. Do not let water get splashed on the blooms. Unpack as quickly as possible, shake gently to let air get between the blooms and put the stems in water again before staging.

Use only Sweet Pea foliage, unless the schedule clearly states, as sometimes in decorative classes, that other foliage is allowed.

Stage one variety in each vase with its name clearly shown.

Bring extra sprays of all the varieties to be staged, lest any become damaged.

VARIETIES FOR GARDEN DECORATION

The Committee of the National Sweet Pea Society recently selected the following 24 varieties as suitable for general cultivation:

AMETHYST, blue.

ASCOT, pink.

AVALANCHE, white.

BEATALL, pale blush cerise.

BEAUTY, pale pink.

BLACK DIAMOND, deep maroon.

CHARMING, cerise.

CORONA, rose.

FLAMINGO, scarlet cerise.

HUNTSMAN, scarlet.

INTERNATIONAL, rosy mauve.

IVORY PICTURE, ivory.

JESSIE, cream pink.

LUSTRE, carmine.

MAGNET, salmon cream pink.

MRS. H. J. WRIGHT, flushed, white ground.

OLYMPIA, purple.

PINKIE, deep pink.

PORCELAIN, pale lavender.

POWERSCOURT, lilac lavender.

SUNKIST, picotee-edged, cream ground.

SYBIL HENSHAW, crimson.

THE ADMIRAL, violet blue.

YOUTH, picotee-edged, white ground.

VIOLAS AND PANSIES

A family whose daughters are noted for their beauties of complexion, figure, feature, and sweetness, will always attract a large following. The Viola family, with the Viola's richness of colour, the Violetta's grace of form, the Pansy's lovely face, and the Violet's sweetness, has become so popular that its fans are associated in a special Viola and Pansy Society. Every year the latest news of the developments and

migrations, the triumphs and the new alliances among *Violas* are published by its Society.

Thus the West sends accounts of Pansy Shows in Michigan, and window-boxes full of *Violas* lovingly tended by the inhabitants of the crowded apartment houses of New York City; the Antipodes speaks of our well-known "*Maggie Mott*" as "the favourite *Viola* of Ballarat," and Pansies, grown from English seed, flower for a splendid brief existence in the heat of Egypt and India. The sweet-scented Violet, on the other hand, needed no dispersion by the hand of man, for it went into voluntary exile in Siberia before ever a Russian prisoner appeared there, it climbed the slopes of the Himalayas when a Mount Everest expedition would have been deemed a sacrilege, and decorated the grasslands of the United States when Washington's Cherry Tree was yet uncut.

As a family, *Violas* are hardy, strong-growing, free-flowering perennials, and will thrive in borders or on the rock garden.

Questioners inquiring the difference between *Viola* and Pansy have only to note that a Pansy has a "face," whereas a *Viola* is usually of a single colour.

A Pansy should, for Show purposes, be minus any wave in its edge, and its thick velvety petals should lie flat and smooth in a perfect circular form.

The brightness of its orange eye should be enhanced by a surrounding dark circular blotch, the three lower petals should also have a distinct belt, equally distant from the blotch in each petal, and the bloom must not measure less than $2\frac{1}{2}$ in. across. But for the ordinary gardener there are many other really beautiful pansies, with wavy edges, and heterodox markings, that will please his eye, though they may win him no prize.

The Show Viola should also be $2\frac{1}{2}$ in. in diameter, but of a clear bright colour without the vestige of a blotch. In rayed varieties, thin rays must be given equality of distribution on the lower and side petals, and though the whole flower should be a smooth round shape, the bottom petal must enlarge to take up almost half the surface, and nearly to cover the side petals, the top pair being evenly matched. The eye should be small, round, bright gold, and clearly defined.

For Violettas the prize-winning qualities are different. Fragrance is essential, but size may be only $1-1\frac{1}{2}$ in. Its shape must be narrow and oval, its petals smooth, of a good substance, and bright clear striking colour, neither ray nor blotch is tolerated, and its foliage will be small and bright with a bushy growth.

Amateurs will ask how to obtain these results. It will depend on

- (1) the variety of seed or cutting;
- (2) good cultivation;
- (3) arrangement for the Show Bench.

VIOLAS AND PANSIES

General methods of cultivation vary for the different species, *e.g.* while *Violas* are more usually propagated by cuttings, *Pansies* are normally grown from seed.

Exhibition and Garden Pansies and *Violas* From Seed.—The amateur will buy his seed (if he does not take the easy, less interesting path, and buy the plants outright) from a reputable seedsman; but it may interest him to know how it has been made to conform to or vary from type.

Growers plant large beds of each single variety, in order to prevent the irregular results of cross pollination by insects. When they wish to obtain new hybrid varieties, they deliberately take pollen from one specific plant, and with a fine brush place it on the pistil of another chosen specimen. When this has been done they enclose the flower in a muslin bag, to ensure that no marauding insect shall spoil the experiment, and when the pod ripens and straightens it is gathered and put into a labelled container. Thus, the natural bursting of the dried pod causes no loss of seed, which in the normal course of events would have been shot out to considerable distances. New varieties thus obtained are selected and grown on for several seasons, "rogues" that appear among the plants being carefully removed from time to time, so that eventually a strain of seed is produced which will come almost true to type.

Sowing.—Seed is sown, in beds in a semi-shady spot in the open, about July, or it can be kept for sowing in forcing-boxes in the following February or March. In the former method, the bed should have been deeply dug and treated with well-rotted manure, the surface being finely broken up and powdered with bonemeal. Shallow drills can be drawn 12 in. apart and the seeds sown thinly along these drills.

Showers, either natural, or from a fine-rosed watering-can, are the next essential. The amateur who is trying by cross-breeding to raise a novelty seedling, will leave these plants until they have flowered. Then he must harden his heart, and ruthlessly take out the least desirable plants, till his chosen varieties have a clear 12 in. space between them each way.

Forcing-Boxes.—If more convenient, the seed is sown in February or March in boxes. The soil for these consists of two parts leaf-mould, two parts good loam, and one part sharp sand, all well sifted and mixed. About 3 in. of this should cover a layer of broken crocks, with the usual drainage holes at the bottom of the box.

This compost is moistened sufficiently to hold together when squeezed in the hand, and filled into the box to within 1 in. of the rim.

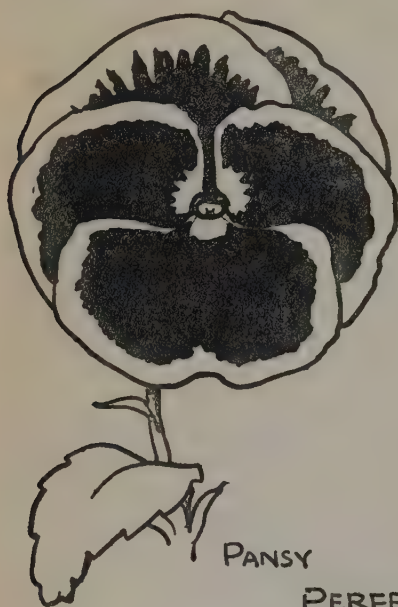
The seed can be mixed with fine sand and sprinkled evenly over the surface with another light sprinkling of sand to cover it. The box is

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then covered with glass to prevent excessive evaporation, and shaded by a sheet of paper.

Any water collecting on the inner side of the glass should be periodically wiped away. It may otherwise cause the seedlings to "damp off."

When the seedlings appear the glass should be raised a little at one side, in order to give air to the plants, and the paper may be dispensed with altogether.



PANSY



VIOLA

PERFECT SHAPES

For Show purposes the Pansy and Viola flowers should be circular in shape

Cultivation.—As soon as the plants are large enough to handle, they are transplanted to a prepared bed, where they are grown on until they are wanted for the border. Overfeeding must be avoided but an occasional dose of artificial fertilizer is useful. At the onset of very hot weather a leaf-mould mulch can be given.

When grown for exhibition, Violas and Pansies need definite restrictions, and three, or at the most four, shoots only are allowed to develop, each of which is secured to a small stake. Summer storms may otherwise damage the flowers. Frequent breaking of the surrounding surface aerates the soil, and gives free access to rains or water.

In addition to this, about two weeks (for Pansies), or three weeks

VIOLAS AND PANSIES

(for Violas) before a Show, all buds showing colour are removed, leaving only one bud on a stem to mature. (Light colours mature a little more rapidly than dark.) The blooms are shaded from rain and splashes, and protected from wind. They are gathered early in the morning, or, if preferred, the night before the Show, and placed in water in a cool place.

Staging.—A green, deep tray, filled with sand, forms a good staging. Each bloom is placed in a tube of water and inserted at such a slope as to show the full face well to the judges. Similar sized blooms are better than a "Triton among the Minnows," and the better blooms show to greater advantage in the top row.

Cultivation of Named Violas.—Named Violas are more often propagated by cuttings, though some strains of seed breed true to type.

Cuttings for autumn planting and early blooming can be taken at the end of July. Short growths pulled from the centre of a vigorous plant, with a bit of root attached, are generally most successful. If too long, the stalk can be cut across, under a joint, with a sharp knife.

Insert the cuttings with a dibber (i.e. a small stick) into the soil of the cold frame, prepared as for seedlings. Leave 3 in. between each cutting in the row, and 6 in. between the rows. Set them firmly, water thoroughly with a fine-rose can, and then shut the frame for ten days.

Should the weather be hot, whitewash the glass and, if necessary, give an occasional fine-spray watering.

After ten days raise the sash a little, wash the glass and, having hardened off the plants, gradually dispense with glass altogether, unless the weather is unusually severe. In the North of England, and exposed positions, protection may be needed all winter.

March is the accepted "planting-out" month, and a trowel the best tool, for a good ball of soil should be lifted out with each plant, as stem and rootlets are alike somewhat brittle.

The bed will have been prepared with deep manuring, surface fertilizer, and lime, and young exhibition plants will be grateful for temporary shelter (*i.e.* cloches) at night. The plants must be 12 in. apart both ways, and occasional evening syringing to discourage insects, periodic hoeing between the lines to keep down weeds, and for the first week or two a stringent picking off of buds to encourage root growth, all help to produce the healthy plant and fine bloom that rewards the good gardener.

In mid-June a mulch of leaf-mould, and either well-rotted manure or spent hops placed on a loosened and previously well-watered soil, will be advantageous.

Exhibition Preparation.—A month before the Show, begin feeding twice a week with weak solution of guano or a general artificial fertilizer.

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Keep the liquid off the leaves if possible. Liquid manure made from stable manure and soot, diluted to a pale straw colour, is also good.

In very dry weather well soak the plants in clear water before applying any fertilizer. Staging, etc., is on the lines already described.

Violettas in Cultivation.—Violettas are the result of a cross between the Blue King Pansy and the Viola Cornuta, and were first grown by Dr. Charles Stuart in Berwickshire. They are propagated on similar lines to Violas, the cuttings being rooted in frames. When transplanted, they thrive best in open soil well enriched with manure. In heavy soil they seldom outlast the winter. They flower rather later than the ordinary viola, but with their dwarf, bushy habit and bright foliage they are ideal for rockery work and bordering.

The Sweet Violet.—*Viola odorata*. These are propagated either by detaching the rooted crowns from the underground stems, or by seed. Seeds are uncertain. They are produced singly in the cleistogamous flowers, and may be dormant for a year or two. Some varieties, such as the Parma Violet, never form seed at all.

Culture.—Planted in an open sunny position they will thrive in medium loam, in clay or in chalk. Farmyard manure is their best fertilizer, varying in amount according to the nature of the soil. Lime is needed in plentiful quantities. Their chief enemies are red spiders and surface grubs. Violets flower freely and for a long period, some from October to April, and some varieties for ten of the twelve months.

Recommended Varieties:

VIOLAS

White Swan.
Orange Yellow Bedder.
John Bastock (white, blue edged).
Maggie Mott (mauve).
John Felstead (deep port wine colour to ruby purple).
Mr. John Sadler (yellow, suffused heliotrope).

PANSIES

Archie Jamieson (plum blotch, pale blue and lemon).
William Harvey (ruby, flaked cream and rose).

Martin Cullow (yellow ground, blue-black blotch).

VIOLETTAS

Queen of the Year (blue, flaked with white).
Lyric (soft mauve).
Tottie (deep mauve).
Gold Crest (yellow).

VIOLETS

Princess of Wales (large, dark blue).
Admiral Avellan (claret-red).
Askania (large, deep purple).
Cœur D'Alsace (rose-pink).

Keen gardeners who are interested in joining special flower societies might like to know the following names and addresses:

FLOWER SOCIETIES

Royal Horticultural Society.—*Hon. Sec.*: Col. F. R. DURHAM, C.B.E., M.C., Vincent Square, London, S.W.1.

Cactus and Succulent Society of Great Britain.—*Hon. Sec.*: Mrs. V. HIGGINS, M.A., F.R.H.S., 28 Northampton Road, Croydon, Surrey.

British Carnation Society.—*Hon. Sec.*: F. W. ALESWORTH, 17 Avenue Road, Isleworth, Middx.

National Carnation and Picotee Society.—*Hon. Sec.*: A. E. MISTON, 10 Brickley Road, Worcester Park, Surrey.

National Chrysanthemum Society.—*Hon. Sec.*: W. WALDMAN, 5 St. Augustine's Street, Derby.

National Dahlia Society.—*Hon. Sec.*: F. W. ALESWORTH, 17 Avenue Road, Isleworth, Middx.

British Delphinium Society.—*Hon. Sec.*: S. HALFORD ROBERTS, "Barnacre," Farm Lane, Purley, Surrey.

British Pteridological Society.—*Hon. Sec.*: F. W. STANSFIELD, M.D., F.L.S., 120 Oxfold Road, Reading, Berks.

British Gladiolus Society.—*Hon. Sec.*: A. E. BLAKE AMOS, 203 Bergholt Road, Colchester, Essex.

Iris Society.—*Hon. Sec.*: C. L. PILKINGTON, Lower Lee, Woolton, nr. Liverpool.

National Auricula and Primula Society.—*Hon. Sec.*: A. S. HAMPTON, 63 Tilehurst Road, Reading.

The Rhododendron Association.—*Hon. Sec.*: GURNEY WILSON, R.H.S., Hall Vincent Square, London, S.W.1.

The National Sweet Pea Society.—*Hon. Sec.*: A. C. BARTLETT, 19 Bedford Chambers, London, W.C.2.

National Viola and Pansy Society.—*Hon. Sec.*: W. W. ALLISON, 10 Elland Grove, Jibland Road, Acocks Green, Birmingham.

CHAPTER VII

USE OF TREES AND SHRUBS—ORDERING AND PLANTING— SHRUB BORDERS—LIST OF POPULAR KINDS

TREES AND SHRUBS

SHRUBS, both evergreen and deciduous, are receiving great attention from all garden lovers in these days, and are of the greatest interest and importance in all gardens, both large and small.

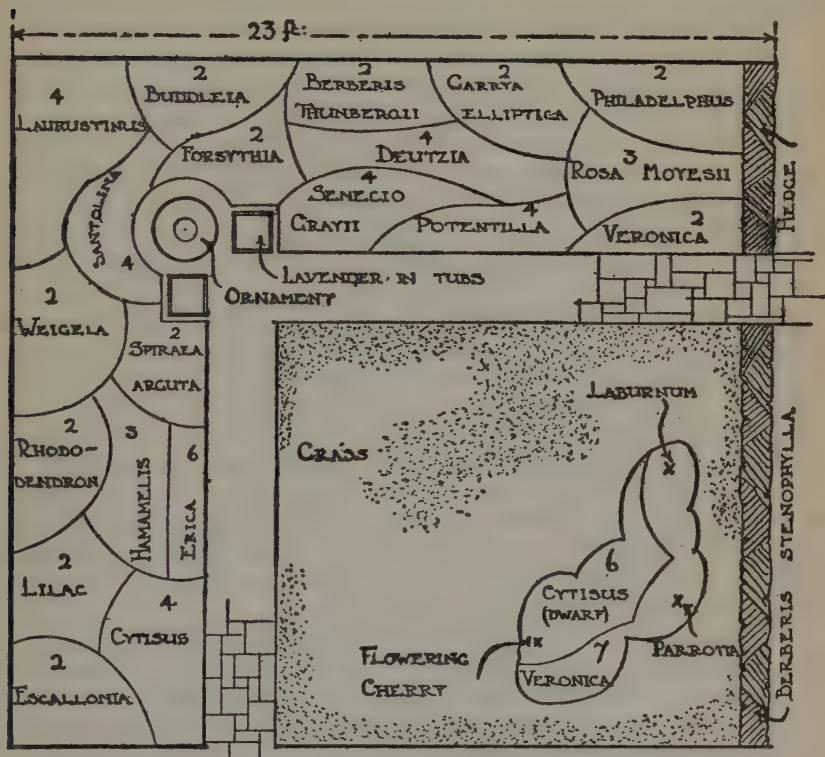
No garden however restricted in extent is too insignificant to have a little collection of choice flowering shrubs. Even in a garden where there is room for only one bed, such a bed planted with a few good Azaleas, with Lilies and other bulbous plants, such as Montbretias and Gladioli, growing between the Azaleas would be a joy for many months every year. Crocus, Wood and other Anemones, Bluebells, etc., could also be used and would add to the interest.

Ericas as Edging to Beds and Borders.—An edging of the Irish heath, *Daboecia polifolia*, both purple and white varieties, would be ornamental from May until November. Some of the dwarf growing heaths might also be used for the purpose, such as *Erica carnea*, rosy red and the white variety; *E. c. King George*, dark red, and the new *Vivelli*, with flowers of brilliant carmine. *E. cinerea*, purple, and the white variety, also the variety *E. c. minor*, which grows only a few inches high, and flowers from June to October. Other varieties are *atrorubens*, rosy red, one of the best, *coccinea*, scarlet red, of dwarf compact habit. A taller growing variety is *darleyensis*, 18 in. of compact cushion-like habit and rosy-red, flowers from November till April. *H. Maxwell* is another very beautiful variety with rosy-red flowers, freely produced from July to October. The Cornish Heath, *Erica vagans* is also useful for the purpose, especially the beautiful variety *Lyonesse* with pure white flowers produced from August to October or later. *Mrs. Maxwell* with flowers of a deep cerise, is very beautiful and is in bloom from July to October. Any of the foregoing would make excellent edgings to such a bed as suggested. All the heaths should be clipped over after flowering, to keep the plant bushy and the edging neat and tidy. This annual clipping or pruning will of course prevent the seeds from maturing and thereby strengthen the plants and assure an abundance of bloom for the following year.

TREES AND SHRUBS

In Border

2 Escallonia langleyensis; 4 Cytisus, Firefly; 2 Lilac, Madame Lemoine; 6 Erica carnea; 3 Hamamelis mollis; 2 Rhododendron, Cynthia; 2 Weigela, Eva Rathke; 2 Spiraea arguta; 4 Santolina; 4 Laurustinus; 2 Buddleia variabilis; 2 Forsythia intermedia spectabilis; 4 Senecio Grayii; 4 Deutzia venusta; 2 Berberis Thunbergii;



Shrub border, in which flowering shrubs are used to give an effect all the year round

2 Garrya elliptica; 4 Potentilla fruticosa; 2 Veronica traversii; 3 Rosa Moyesii; 2 Philadelphus, Dame Blanche.

On Lawn

6 Cytisus Ardoinii; 7 Veronica traversii; 1 Standard Laburnum Vossii; 1 Standard Parrotia; 1 Standard Cherry, Hizakura.

The Centre of the Bed.—A standard Wistaria, planted in the centre would be an additional attraction. In gardens where more space is available, larger shrubs than Azaleas may be used. Before planting,

or even ordering the shrubs, careful thought should be given to the positions they are to occupy, to their environment and the proximity of other plants. One must look ahead and try to picture the garden as it will appear in the future, when the shrubs reach maturity. And remember that a fine form or variety does not take up more room than a common or ordinary variety. The smaller the garden, the greater is the care to be exercised in the selection of the shrubs for its embellishment.

Planting for Effect.—When planting shrubs in groups the best effect is obtained by planting several of the same kind together, taking care to allow for each individual shrub ample room for development. A group of three or more of one kind gives a far finer effect than if they were scattered about in different parts of the garden. And in the case of berry-bearing shrubs whose flowers are unisexual—the male and female flowers being borne on different plants—it is essential to order plants of both sexes. The female shrubs bear the berries only when a male plant is growing near by, so that its pollen can fertilize the female flowers. Examples are the Holly and Aucuba.

Selection of Flowering Shrubs.—By careful selection it is possible to have flowering shrubs in bloom throughout the year.

Early Flowering Shrubs.—Amongst those which produce their flowers early in the season are the Almonds, Witch Hazels, Flowering Currants, Flowering Cherries, Forsythias, Rhododendron præcox, and R. Nobleanum, Magnolias, Heaths, Camellias, Spiræas and Daphnes.

Later Flowering Shrubs.—Then follow the exquisite flowering Crabs, Ceanothuses, Spiræas, Kerrias, Brooms, Lilacs, Laburnum, and hosts of Rhododendrons, Azaleas, and certain Rose species. These in turn are succeeded by the Mock Oranges, Buddleias, Escallonias and the deciduous Ceanothuses, Cydonias, Cytisus, &c.

Autumn Flowering Shrubs.—During autumn the Heaths are a host in themselves, and a Heath garden makes a charming feature in a large garden, a garden within a garden. Veronicas, and Hibiscus are also indispensable at that time of year, and the value of the late flowering Clematis must not be overlooked.

Winter Flowering Shrubs.—During the winter we have the very sweet-scented *Chimonanthus fragrans*, and *Lonicera fragrantissima*, the well known yellow *Jasminum nudiflorum*, *Viburnum Tinus* and *V. fragrans*, *Rhododendron Nobleanum*, *Prunus subhitella autumnalis*.

Cultivation.—Deep digging or trenching to a depth of about 2 ft. is strongly recommended some time before the actual planting takes place. If procurable, well decayed manure or flaky leaf-mould should be added for most shrubs; and in the case of peat-loving shrubs, peat may be used entirely or incorporated with the soil. Many peat-loving shrubs will thrive well in loam and leaf-mould, provided the loam is lime free.

Spacing.—It is better to allow too much room for each individual than for them to be planted too close, as small shrubs or herbaceous plants can be grown between them for a few years and then moved elsewhere. Ample space is imperative for shrubs to show their individual character and habit of growth and for their proper development and general well-being.

Shrubs on Lawns.—When flowering shrubs are to be planted in beds on lawns, the beds should be made large enough to allow of a space of 3 ft. of soil around the shrubs. This should be kept free of weeds and top dressed with manure or leaf-mould every year. Such bulbous plants as Crocus, Snowdrops, Gladioli and Anemones may be grown in the beds.

Ordering the Shrubs.—This is a very important matter. They should be purchased from really high-class firms who specialize in shrubs, and who pay proper attention to regular transplanting. Far better buy a few first-class shrubs from a reliable firm, than procure a larger quantity of indifferent quality. The collection can be added to each year, as one's interest increases. The best varieties of the different species are enumerated later in this chapter.

Time of Planting.—The best time to plant deciduous shrubs is from the latter part of October to March, provided the weather is open and the soil not too wet. October for preference, as the soil is still warm then, and the roots will establish themselves in their new quarters before winter.

Evergreen shrubs should be planted earlier in the autumn, during September if possible, or the early part of October. The next most suitable time is during April or quite early in May, provided that month is showery. Avoid planting evergreen shrubs in the depth of winter or when strong drying winds prevail.

Planting Shrubs from Pots.—Shrubs which have been grown in pots may be planted at almost any time of the year. The essential point to attend to is to soak the ball of soil well before planting, and to disturb the roots as little as possible. If planted during dry summer weather, shading and watering may be necessary, and mulching with decayed leaves or manure.

Transplanting Large Shrubs.—When planting shrubs of considerable size, a judicious thinning out and reducing the length of the branches should be practised.

Treatment of Shrubs Received During Frosty Weather.—The shrubs may be "laid in" in a sheltered part of the garden, or kept in a shed and covered with sacking or paper and the roots kept moist until the soil is in a fit state for planting.

Pruning of Roots before Planting.—All damaged roots should be

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carefully cut away, the cut pointing upwards. Never plant shrubs without attending to this important point. New fibrous roots will soon form, resulting in fine healthy growth.

Pruning Shrubs.—The time for pruning flowering shrubs depends on their season of blooming, and whether the bloom is produced on the old or the new wood. Those shrubs which bear their flowers on the current year's shoots, may be cut hard back, say to within 2 in. of the old wood, any time from October to the end of February. Shrubs which flower on the shoots made during the previous summer, should be pruned immediately after flowering. This is most important, so as to enable the plants to produce their new shoots as soon as possible, and for the wood to ripen well before the advent of winter. On this newly-formed wood the flowers will be produced the following year.

Pruning Evergreen Shrubs.—Generally speaking, the only pruning necessary in the case of evergreen shrubs is the trimming of any straggling shoots, and the removal of some of the branches to avoid overcrowding. This work is best done in April.

How to Prune.—The object of pruning flowering shrubs is to let in the light and air to enable the wood to ripen properly. Keep the centre open. A sharp pruning knife should be used or, better still, some of the new secateurs with knife-like cut. A clean cut is important. Begin the cut on the opposite side of the bud to be pruned to, and finish just above the tip of the bud.

Root Pruning.—When flowering shrubs make too much growth at the expense of the bloom, the plants may be taken up, and the roots shortened. In the case of large shrubs, a trench may be dug round the shrub and the roots pruned without the actual removal of the plant. Ram the soil in well after it has been replaced. Firm planting is most important.

LISTS OF SHRUBS FOR SPECIAL PURPOSES

Trees and Shrubs with Coloured Stems in Winter

<i>Betula albo-sinensis.</i>	<i>Ribes atrosanguineum.</i>
„ <i>Ermanii.</i>	<i>Rubus, Giral dianus.</i>
„ <i>japonica.</i>	„ <i>biflorus.</i>
„ <i>lenta.</i>	„ <i>lasistylus.</i>
<i>Cornus alba siberica.</i>	„ <i>leucodermis.</i>
<i>Forsythia intermedia spectabilis.</i>	<i>Salix, babylonica ramulis aureis.</i>
„ <i>viridissima.</i>	„ <i>daphnoides.</i>
<i>Kerria japonica</i>	„ <i>vitellina.</i>
<i>Leycesteria formosa.</i>	„ „ <i>britzenis.</i>
<i>Perowskia atriplicifolia.</i>	

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Choice Flowering Shrubs for a South or West Wall

Abelia, various.	Fremontia californica.
Abutilon megapotamicum.	Fuchsia macrostemma corallina.
Azara lanceolata.	Guevina Avellana.
„ dentata.	Hibiscus, various.
Ceanothus, various.	Hydrangea hortensis.
Ceratostigma Willmottianum.	Lonicera fragrantissima.
Chimonanthus fragrans.	„ Standishii.
Choisya ternata.	Myrtus (Myrtle).
Cistus, various.	Passiflora (Passion Flower).
Corokia.	Prunus triloba.
Elsholtzia Stauntoni.	Pyrus japonica.
Escallonia, various.	Solanum jasminoides.
Eugenia apiculata (Myrtus Luma).	Tecoma grandiflora.
Fabiana imbricata.	„ radicans.
Feijoa Sellowiana.	Teucrium fruticans.
Fendleri rupicola.	Veronica, various.

Winter Flowering Shrubs

The garden need not be dull and uninteresting during the winter months. The following shrubs will be found useful to give colour and interest to all gardens throughout the winter:

Andromeda floribunda.	Hamamelis, various.
Arbutus unedo.	Jasminum nudiflorum.
Berberis japonica.	Laurustinus.
Calycanthus præcox.	Lonicera Standishii.
Cornus Mas.	Magnolia stellata.
Corylopsis.	Nuttallia cerasiformis.
Cydonia or Pyrus.	Rhododendron præcox.
Daphne mezereum.	„ nobleanum.
Erica.	Ulex europæus flore pleno.
Garrya elliptica.	

Trees and Shrubs for Autumn Colouring

The value of colour in the garden during autumn and early winter is now more appreciated than formerly, and considerable attention is being devoted to this important feature. The superb colouring of some of the Maples (Acers) and Berberis, Rhus, Euonymus, Vitis, Enkianthus, and Spiræas, such as prunifolia flore pleno has to be seen to be believed.

The following is a list of some of the finest shrubs for the purpose, and a selection can be made therefrom to suit all gardens:

Acer cappadocicum.	Acer cratægifolium.
„ circinatum.	„ japonicum.

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<i>Acer palmatum.</i>	<i>Ginkgo biloba</i> (The Maidenhair Tree).
<i>Amelanchier laevis.</i>	<i>Kœlreuteria paniculata.</i>
<i>Ampelopsis Veitchii.</i>	<i>Liquidamber styraciflua.</i>
<i>Azaleas, various.</i>	<i>Pyrus Torminalis.</i>
<i>Berberis Thunbergii.</i>	<i>Quercus coccinea.</i>
„ <i>angulosa.</i>	<i>Rhus copallina.</i>
„ <i>atrocarpa.</i>	„ <i>cotinus folius purpureis.</i>
„ <i>concinna.</i>	„ <i>Osbeckii.</i>
„ <i>Sieboldii.</i>	„ <i>potaninii.</i>
„ <i>Thunbergii.</i>	„ <i>typhina.</i>
„ <i>Wilsonae.</i>	<i>Ribes americanum.</i>
<i>Cercidiphyllum japonicum.</i>	„ <i>aureum.</i>
<i>Cratægus cordata.</i>	<i>Spiræa prunifolia flore pleno.</i>
„ <i>prunifolia.</i>	<i>Stephanandra flexuosa.</i>
„ <i>crus gallii.</i>	„ <i>Tanakæ.</i>
<i>Cupressus ericoides.</i>	<i>Viburnum opulus.</i>
<i>Cryptomeria japonica elegans.</i>	„ <i>tomentosum.</i>
<i>Enkianthus campanulatus.</i>	<i>Vitis amurensis.</i>
„ <i>c. Palabini.</i>	„ <i>Coignetiae.</i>
„ <i>perulatus.</i>	„ <i>Davidii.</i>
<i>Euonymus alatus.</i>	„ <i>Henryana.</i>
„ <i>europæus.</i>	„ <i>inconstans</i> (<i>Ampelopsis</i>
„ <i>lancifolius</i> (evergreen).	„ <i>Veitchii</i> of gardens).
„ <i>latifolia.</i>	„ <i>quinquefolia</i> (The true Vir-
„ <i>sanguineus.</i>	„ <i>ginian Creeper</i>).
„ <i>radicans</i> (evergreen).	„ <i>Thunbergii.</i>
<i>Fagus sylvatica cuprea</i> (Copper Beech).	„ <i>vinifera purpurea.</i>

Trees and Shrubs with Grey Foliage

A few shrubs with grey foliage should be grown in all gardens. They are most useful to blend with flowers of all colours, and make an excellent and attractive background for bright colours. And, of course, they are valuable associated with cut flowers, and make charming pictures by themselves. The following is a good selection:

<i>Acer dasycarpum.</i>	<i>Cupressus Fletcheri.</i>
<i>Atriplex Halimus.</i>	„ <i>Fraseri.</i>
<i>Berberis dictyophylla.</i>	„ <i>Wisselii.</i>
<i>Buddleia variabilis.</i>	<i>Eleagnus angustifolia.</i>
<i>Caryopteris Mastacanthus.</i>	<i>Eucalyptus, Gunnii.</i>
<i>Cotoneaster Franchetii.</i>	„ <i>Macarthuri.</i>
<i>Cupressus allumii.</i>	„ <i>paucifolia.</i>
„ <i>argentea.</i>	

TREES AND SHRUBS

Hippophae rhamnoides

(Sea Buckthorn).

Juniperus virginiana glauca.

Lavandula (Lavender).

Perowskia atriplicifolia.

Phlomis fruticosa.

Populus alba (Poplar).

„ „ *pyramadalis*.

Pyrus Mongeotii.

„ *salicifolia*.

Rosemarinus (Rosemary).

Santolina Chamaecyparissus.

Senecio Greyi.

Tamarix hispida.

Teucrium fruticans.

Tilia argentea (Lime).

TREES AND SHRUBS WITH HANDSOME BERRIES AND FRUITS

Berried shrubs are a very important and interesting feature of gardening, especially during the autumn and winter. Many of them remain attractive over a long period. The red berries of *Cotoneaster rotundifolia*, for instance, persist throughout the winter, and the shrub is an object of great beauty from autumn until about March. The Holly is another instance of sustained beauty. *Arbutus Unedo* is an especially attractive and interesting shrub or small tree, with its white pitcher-shaped flowers and red, strawberry-like fruits, which appear at the same time and on the same bush. Its evergreen foliage and red bark are additional attractions.

Ailanthus glandulosa.

Aralia Sieboldii.

„ *spinosa*.

Arbutus unedo.

Aucuba japonica.

Billardiera longiflora.

Celastrus articulatus.

„ *scandens*.

Clerodendron Fargesii.

„ *trichotomum*.

Corokia Cotoneaster.

Cotoneaster aldenhamensis.

„ *ambigua*.

„ *bullata*.

„ *Dammeri*.

„ *disticha*.

„ *divaricata*.

„ *Franchetii*.

„ *glaucophylla*.

„ *Henryana*.

„ *horizontalis*.

„ *lactea*.

„ *rotundifolia*.

Crataegus Carrierei.

„ *cordata*.

„ *Dippeliana*.

„ *prunifolia*.

Hippophae rhamnoides.

Buckthorn.

Ilex. Holly.

Lonicera. Honeysuckle.

Nandina domestica.

Pyracantha augustifolia.

Pyracantha coccinea Lalandii.

„ *Gibbsii*.

Pyrus.

Rosa. *Fargesii*, *Davidii*, *Lucida*,

Moyesii, etc.

Sambucus racemosa (Scarlet-red
berried Elder).

Skimmia japonica.

Stranvæsia Davidiana.

„ *lucida*.

„ *salicifolia*.

Vitis heterophylla.

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The following list contains the most important flowering shrubs with evergreen foliage, including some of the most beautiful flowering shrubs for English gardens:

Azalea amoena.	Helianthum.
„ balsaminæfolia (rosæflora)	Euonymus japonica.
„ ledifolia.	Hypericum. St. John's Wort.
„ macrantha.	Kalmia latifolia.
„ malvatica.	Lavandula. Lavender.
„ obtusa.	Leptospermum.
Berberis.	Magnolia grandiflora.
Camellias.	„ Delvavayi.
Carpentaria californica. Californian Mock Orange.	Olearia.
Ceanothus. Californian Lilac.	Pieris.
Choisya ternata. Mexican Orange Flower.	Rhododendrons.
Cistus. Rock Rose.	Ribes Cayanum.
Cotoneaster.	„ laurifolium.
Daphne.	Senecia.
Erica. Heath.	Sophora tetraptera.
Escallonia.	Veronicas.
Eucryphia cordifolia.	Viburnum.
Fabiana imbricata.	Yucca.
	Zenobia pulverlunta.

SHRUBS WHICH WILL THRIVE IN SHADY PLACES AND UNDER TREES

The number of shrubs which will prosper under trees or in shady places is limited. Among the most suitable are the following:

Aralia Sieboldii.	Hypericum calycinum.
Aucuba japonica.	Ilex. Holly.
Berberis aquifolium.	Laurustinus.
Buxus. Box.	Leycesteria formosa.
Clematis montana.	Ligustrum. Privet.
Danæa racemosa.	Lonicera.
Deutzias.	Phillyrea.
Euonymus radicans.	Phormium tenax.
Garrya elliptica.	Rhododendron ponticum.
Gaultheria Shallon.	Ribes alpinum.
Hedera. Ivy.	Rubus deliciosus.
Hydrangeas.	Ruscus aculeatus.
Hypericum Androsæmum.	Viburnum opulus.

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SHRUBS AND TREES FOR WINDY POSITIONS

When selecting shrubs and trees for positions exposed to rough winds, such as many sea-side gardens, it is important to avoid those plants which have a shallow rooting system. The following list can be confidently recommended:

<i>Acer pseudoplatanus.</i>	<i>Lupinus arboreus.</i>
<i>Buddleia globosa.</i>	<i>Olearia Forsteri.</i>
<i>Cratægus.</i>	„ <i>Haastii.</i>
<i>Cupressus macrocarpa</i> (for sea-side districts only).	„ <i>macrodonta.</i>
<i>Cytisus albus.</i>	<i>Pinus austriaca.</i>
„ <i>nigricans.</i>	„ <i>Laricio.</i>
„ <i>præcox.</i>	„ <i>montana.</i>
„ <i>scoparius.</i>	„ <i>muricata.</i>
<i>Elæagnus angustifolia.</i>	„ <i>Pinaster.</i>
„ <i>macrophylla.</i>	„ <i>Thunbergii.</i>
„ <i>multiflora.</i>	<i>Populus trichocarpa.</i>
„ <i>pungens.</i>	<i>Quercus Ilex.</i> Evergreen Oak.
<i>Euonymus japonica</i>	<i>Rhamnus.</i> Buckthorn.
„ <i>radicans.</i>	<i>Rosmarinus.</i> Rosemary.
<i>Fraxinus.</i> Ash.	<i>Sambucus nigra, folius aureis.</i>
<i>Fuchsia Riccartonii.</i>	<i>Senecio Greyi.</i>
<i>Hypericum.</i> St. John's Wort.	<i>Tamarix.</i>
<i>Lavandula spica.</i>	<i>Ulex.</i> Gorse.
<i>Lonicera nitida.</i>	<i>Veronica.</i>

SHRUBS FOR PLANTING ON DRY, SUNNY POSITIONS, BANKS, Etc.

By planting suitable shrubs, a dry, uninteresting slope or bank may, at little expense, be converted into a thing of beauty, provided the right subjects are chosen. The following shrubs are recommended for this purpose:

<i>Cistus laurifolius.</i>	<i>Genista dalmatica.</i>
„ <i>cyprius.</i>	„ <i>germanica.</i>
„ <i>Lorettii, etc.</i>	„ <i>hispanica.</i>
<i>Cotoneaster.</i>	„ <i>radiata.</i>
<i>Cytisus.</i> Broom.	<i>Helianthemum.</i>
<i>Erica</i> in variety.	<i>Lavandula.</i> Lavender.
<i>Erinacea pungens.</i>	<i>Linum arboreum.</i>
<i>Escallonia edinensis.</i>	<i>Lonicera pileata.</i>
<i>Genista anglica.</i>	<i>Lycium chinense.</i>

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Rosmarinus. Rosemary.
Santolina chamæcyparissus.
Senecio Greyi.

Spartium junceum. Spanish
Broom.
Ulex. Furze. Gorse or Whin.
Yucca.

SHRUBS AND TREES WHICH THRIVE IN POOR DRY SANDY SOILS

Those who reside in dry, sandy districts, need not despair of having gardens of beauty and interest. It is a question of selection, knowing what plants will thrive under such apparently adverse conditions. Here is a list of suitable subjects:

Aralia chinensis.
Berberis aquifolium.
 „ Darwinii.
 „ stenophylla.
 „ Thunbergii.
Betula verrucosa. Silver Birch.
Castanea. Sweet Chestnut.
Ceratostigma willmottiana.
Cistus. Rock Rose.
Cytisus. Broom.
Erica. Heath.
Escallonia edinensis.
Fabiana imbricata.
Fremontia californica.
Genista radiata.
Halimodendron argenteum.
Helianthemum. Sun Rose.

Hippophæ. Sea Buckthorn.
Lavandula. Lavender.
Philadelphus. Mock Orange.
Pinus Banksiana.
 „ contorta.
 „ Laricio.
 „ Pinaster.
Rhamnus.
Rhus.
Robinia.
Rosa spinosissima
 „ „ altaica.
Rosmarinus. Rosemary.
Spartium junceum. Spanish
Broom.
Ulex. Gorse, double and single.

SHRUBS AND DWARF TREES WHICH THRIVE IN MOIST AND BOGGY DISTRICTS AND POSITIONS

The number of shrubs and trees which may be expected to thrive in very moist and boggy ground is necessarily limited. Any or all of the following may be planted with confidence:

Alnus (Alder) glutinosa. „ incana. „ nitida. „ serrulata. Andromeda polifolia. Bog Rose- mary. Betula nana. Dwarf Birch. „ nigra.	Betula pubescens. „ verrucosa. Clethra alnifolia. Cornus alba and varieties. Thrives in very wet ground. Cydonia vulgaris lusitanicus. Quince. Davidia vilmoriniana.
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<i>Myrica cerifera.</i>	<i>Salix fragilis.</i>
„ <i>gale.</i>	„ <i>incana.</i>
<i>Oxycoccus macrocarpus.</i> Cranberry.	„ <i>purpurea.</i>
<i>Picea sitchensis.</i>	„ <i>viminalis.</i>
<i>Populus</i> , all species. Poplar.	<i>Sambucus.</i> Elder.
<i>Salix vitellina.</i> Willow.	<i>Spiræa.</i>
„ <i>daphnoides.</i>	<i>Taxodium distichum.</i> Swamp
„ <i>acutifolia.</i>	Cypress.
„ <i>alba.</i>	<i>Xanthoceras sorbifolia.</i>
„ <i>babylonica.</i>	

SHRUBS AND TREES USEFUL IN TOWN GARDENS AND SMOKY DISTRICTS

It is remarkable how well many shrubs thrive in large towns; as may be seen in the London parks and squares.

The following selection will be found suitable for the purpose:

<i>Acer dasycarpum.</i>	<i>Cydonia japonica</i> and <i>C. maulei.</i>
„ <i>negundo.</i>	<i>Daphne mezereum.</i>
„ <i>platanoides.</i>	<i>Deutzia</i> of sorts.
„ <i>pseudo-platanus.</i>	<i>Diplopappus.</i>
<i>Ailanthus glandulosa.</i>	<i>Fagus.</i> (Beech.)
<i>Aesculus hippocastanum.</i>	<i>Forsythia intermedia</i>
<i>Amelanchier.</i>	„ „ <i>spectabilis.</i>
<i>Ampelopsis veitchii.</i>	<i>Fraxinus.</i> (Ash.)
<i>Arbutus unedo.</i>	<i>Hedera.</i> (Ivy.)
<i>Aucuba japonica.</i>	<i>Hypericum calycinum,</i> Rose of
<i>Azalea mollis.</i>	Sharon and others.
<i>Berberis aquifolium.</i>	<i>Ilex.</i> Holly.
„ <i>dulcis.</i>	<i>Jasminum.</i>
„ <i>stenophylla.</i>	<i>Juglans.</i>
„ <i>thunbergii.</i>	<i>Kerria japonica.</i>
„ <i>vulgaris.</i>	<i>Koelreuteria paniculata.</i>
<i>Betula.</i> (Birch.)	Laurel.
<i>Buxus.</i> (Box.)	<i>Laburnum.</i>
<i>Carpinus.</i>	<i>Ligustrum.</i>
<i>Catalpa bignonioides.</i>	<i>Olearia Haastii.</i>
<i>Colutea arborescens.</i> (The Bladder	<i>Philadelphus</i> of sorts. (Mock Orange.)
Senna.)	<i>Pinus austriaca.</i>
„ <i>orientalis.</i>	<i>Platanus,</i> (Plane.)
<i>Cornus alba siberica,</i> Kousa, etc.	<i>Prunus Amygdalus.</i>
<i>Corylus maxima atropurpurea.</i>	„ <i>cerasus.</i>
(The Purple-leaved Filbert.)	„ <i>pissardii.</i>
<i>Cotoneaster</i> , various.	<i>Pyrus aucuparia.</i> (Mountain Ash.)

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<i>Pyrus malus</i> , various varieties.	<i>Skiminia</i> .
<i>Quercus</i> . (Oak.)	<i>Symphoricarpus</i> .
<i>Rhododendrons</i> .	<i>Syringa</i> . Lilac.
<i>Rhamnus alternus</i> .	<i>Taxus</i> . Yew.
<i>Rhus cotinus</i> .	<i>Viburnum opulus</i> .
<i>Ribes</i> . Flowering currants and gooseberries.	„ <i>plicatum</i> .
<i>Sambucus</i> .	„ <i>tinus</i> .
	<i>Yuccas</i> .

SHRUBS FOR FORCING

Among the many flowering shrubs suitable for forcing, the following are some of the most useful and beautiful:

Almonds, various.	Peach, double and single.
Azaleas, various.	<i>Plumbago capensis</i> .
<i>Choisya ternata</i> .	<i>Prunus</i> in variety.
<i>Dentzia gracilis</i> .	<i>Rhododendrons</i> .
Hydrangeas.	Roses.
Laburnums.	<i>Wistaria</i> .
Lilacs.	

SHRUBS AND CLIMBERS FOR NORTH WALL

A North wall need not be the dull place it often is in gardens. A number of beautiful flowering shrubs will prosper there, and one of the most useful is the Morello Cherry.

The following is a choice selection:

<i>Actinidia chinensis</i> . Beautiful autumn foliage.
<i>Akebia lobata</i> . Purple flowers.
<i>Azara microphylla</i> . Vanilla-scented flowers in spring.
<i>Berberidopsis</i> . Very beautiful deep coral flowers.
<i>Buddleia Veitchiana</i> .
<i>Calycanthus floridus</i> , the Allspice. Very fragrant flowers.
<i>Celastrus scandens</i> . Attractive foliage and fruit in autumn.
<i>Clematis flammula</i> .
<i>Cocculus carolinus</i> . White flowers, red berries.
<i>Crinodendron Hookeri</i> . Waxy-red flowers.
<i>Escallonia macrantha</i> . Red flowers in great profusion.
<i>Lapageria</i> . Red and white varieties.
<i>Periploca græca</i> . The Silk Vine.
<i>Senecio scandens</i> . Yellow daisy-like flowers.

SHRUBS AND TREES FOR CHALKY SOIL

As a result of much experimenting in gardens and nurseries in chalky districts, it has been discovered that quite a large number of trees and

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shrubs will thrive in chalky ground. The following is the most up-to-date list and is recommended with every confidence:

<i>Abies cephalonica</i>	<i>Erica stricta</i> ¹
„ <i>cilicia</i>	<i>Escallonia</i>
„ <i>numidica</i>	<i>Fabiana imbricata</i>
„ <i>recurvata</i>	<i>Forsythia</i>
<i>Abelia chinensis</i>	<i>Fremontia californica</i>
<i>Abutilon vitifolium</i>	<i>Fuchsia gracilis</i>
<i>Alnus cordata</i>	„ <i>Riccartonii</i>
<i>Arbutus unedo</i>	<i>Genista ætnensis</i>
<i>Arundinaria japonica</i>	„ <i>hispanica</i>
„ <i>nitida</i>	<i>Hypericum</i> . (St. John's Wort)
Beech, all species	<i>Kerria japonica</i> . (Jew's Mallow)
<i>Berberis Wilsonae</i>	<i>Laurus</i> (Bay)
„ <i>stenophylla</i>	<i>Lavendula</i> . (Lavender)
„ <i>Gagnepainii</i>	<i>Lavatera olbia</i> . (Mallow)
<i>Berberis Sargentiana</i>	<i>Lilacs</i>
<i>Buddleia, alternifolia</i> .	<i>Lippia</i> . (Lemon-scented Verbena)
„ <i>variabilis</i> .	Only for mild districts.
<i>Caryopteris tangutica</i> .	<i>Lithospermum rosmarinifolium</i>
<i>Ceanothus dentatus</i>	<i>Magnolia acuminata</i>
„ <i>Gloire de Versailles</i>	„ <i>Delavayi</i>
„ <i>Veitchii</i>	<i>Olearia macrodonta</i> . (Daisy Bush)
<i>Ceratostigma Willmottianum</i> .	<i>Pinus Larico nigricans</i>
<i>Cercidiphyllum</i> .	<i>Pinus leucodermis</i>
<i>Cistus corbariensis</i> .	<i>Pittosporum Tobira</i>
<i>Clematis alpina</i>	<i>Populus canescens</i>
„ <i>Amanda</i> .	„ <i>marilandica</i>
„ <i>montana</i> .	<i>Prunus</i>
<i>Clematis tangutica</i>	<i>Punica granatum</i> . Pomegranate.
<i>Colutea arborescens</i>	(Quite hardy on wall at Kew and
<i>Cornus alba</i>	flowers abundantly.)
<i>Cydonia</i>	<i>Quercus</i> (Oak) most species
<i>Cytisus monspessulanus</i>	<i>Rhus cotinus</i>
„ <i>nigricans</i>	„ <i>typhina</i>
<i>Daphne cneorum</i>	<i>Ribes sanguineum</i> . Flowering
<i>Davidia Vilmoriniana</i>	Currant
<i>Drimys Winteri</i>	<i>Robinia</i> . False acacia
<i>Erica arborea</i> ¹	<i>Romneya Coulteri</i>
„ <i>carnea</i> ¹	Rose species, various
„ <i>darleyensis</i> ¹	<i>Salix daphnoides</i> . Willow
„ <i>mediterranea</i> ¹	„ <i>viminialis</i> . Osier Willow

¹ To do well, these need a fair depth of soil over the chalk.

COMPLETE GUIDE TO HOME GARDENS

Sambucus Elder. All species	Spiræa Lindleyana
Solanum jasminoides	Sycamore
Sophora japonica	Syringa (Lilacs)
Spiræa Aitchisonii	Veronica salicifolia
„ arborea	„ Andersonii
„ japonica	

SHRUBS AND TREES WITH VARIEGATED FOLIAGE

While shrubs with variegated leaves do not appeal to all gardeners, they have their value in the garden, especially in the dull days of winter and autumn, but they should always be planted sparingly. In some gardens they are kept together in a place apart, where they make pleasing patches of colour when flowers are scarce. As a guide to planters the variegation is indicated after each name.

- Acanthopanax spinosus variegatum. Leaves edged white.
 Acer Negundo variegatum. White.
 „ „ elegantissimum. Golden.
 „ platanoides. White.
 „ pseudoplatanus Drummondii. White.
 „ „ Leopoldii. White.
 Aucuba japonica variegata. Mottled yellow and green.
 Buxus sempervirens argentea. Silver.
 „ „ aurea maculata. Golden yellow.
 „ „ variegata. Golden.
 Cornus alba Spæthii. Golden.
 „ Mas variegata. Silver.
 Cupressus Lawsoniana variegata. Golden.
 „ obtusa alba variegata. Silver.
 „ pisifera nana aureo-variegata. Yellow.
 Diervilla florida variegata. Silver.
 Eleagnus pungens aureo-variegata. Gold.
 „ „ variegata. Cream.
 Euonymus japonicus aureo-pictus. Golden.
 „ radicans "Silver Gem," Silver, bordered pink.
 „ „ variegata. Silver.
 Hedera (Ivy) canariensis variegata. Silver.
 „ „ azorica variegata. White.
 „ Helix. "Lee's Silver."
 Ilex aquifolium argentea marginata. Silver.
 „ „ „ pendula. Silver.
 „ „ aurea regina. Golden.
 „ „ "Golden King." Golden.

Ilex aquifolium ovata aurea. Golden margin.
Juniperus chinensis japonica albo-variegata. White.
 „ *Sabina variegata.* Cream.
Kerria japonica variegata. Silver-grey.
Libocedrus decurrens variegata. Golden yellow.
Ligustrum ovalifolium variegatum. Golden.
Liriodendron tulipifera aureo-variegata. Golden.
Osmanthus aquifolium argentea variegatus. Silver.

Abelia (a-bè-lia) Caprifoliaceæ.—Evergreen and deciduous flowering shrubs from India, China, Japan and Mexico. They grow from 2–10 ft. high and bear funnel-shaped flowers. Abelias are of easy cultivation in good loamy soil, and (in cold districts) near the protection of a warm, sunny wall. A little sandy leaf-mould or peat should be added to the soil at the time of planting, to give the plants a start. Cut back after flowering. Propagation is by cuttings of half-ripened wood, taken in July or August, and placed in pots of sandy soil in greenhouse or frame or under a hand-light.

The following species are the best for general cultivation:

A. chinensis (syn. *rupestris*).—Introduced from China in 1816. Deciduous, 3–4 ft. high. Flowers sweetly-scented, opening pink, passing to white, freely produced in summer and early autumn. Somewhat tender. A fine wall plant.

A. floribunda.—An evergreen species from Mexico, bearing long, rosy-red, tubular flowers, 1½–2 in. long, in June and July. A strong grower, and needs the protection of a wall. One of the most beautiful.

A. Graebneriana.—A recently introduced species from China, and one of the most hardy. Flowers, pale pink, with a yellow throat. Height 3–5 ft.

A. grandiflora.—A hybrid of elegant habit, bearing a profusion of funnel-shaped flowers, white tinged with pink, freely produced from July to October. Height about 4 ft.

A. Schumannii (*longituba*).—A Chinese species of weeping habit, growing about 8 ft. high on a warm sunny wall, and bearing lovely soft rose-coloured flowers, suffused with lilac, during July and August.

A. serrata (*uniflora*).—A slow-growing Chinese and Japanese species of compact habit, and bearing masses of creamy-white flowers, with orange markings, during June. Height 2 ft.

A. triflora.—A Himalayan species of graceful habit, attaining to a height of about 12 ft., and bearing, in June, numerous jessamine-like flowers of rosy-white, and very fragrant.

Abies (ā-bī-ēs), the “Silver Firs.”—Evergreen conifers of a sym-

metrical habit of growth and noble proportions, some species attaining to a height of 300 ft., and of variable contour and colour. They are of very great economic value and are much used for ornamental planting and for shelter in large gardens and parks. Although the Silver Firs succeed in poor soils, they succeed best in good deep loam, and do not object to a chalk sub-soil provided the top soil is of a fairly good depth of 2 ft. or so. They like a moist climate. Plant in October or early April.

Propagation is best by seed sown in the open in spring, although cuttings will root if taken with a heel or small piece of the old wood attached and inserted singly in small pots, and placed in a gentle bottom heat. Seedlings make the most satisfactory plants.

The following are some of the finest species and varieties:—

A. amabilis.—The “White Fir” of North America. A rare and very beautiful species for non-chalky soils. Height 250 ft.

A. balsamea.—The “Balsam Fir” of North America grows to a height of 50–70 ft.

A. b. Hudsonia.—A dwarf-growing variety, from 1–2 ft. high.

A. b. macrocarpa.—A variety with leaves and cones larger than the type.

A. brachyphylla.—The “Nikko Fir” of Central Japan. A very hardy and handsome species, growing well in most soils. The cones are rich purple. The most suitable *Abies* for town-planting.

A. bracteata.—A rare and very beautiful and distinct species from the Santa Lucia Mountains of California. Requires a sheltered situation, free from spring frost. Height 100–150 ft.

A. cephalonica.—A handsome Grecian species with sharp-pointed leaves. Succeeds on chalky soils. Height 100 ft.

A. cilicica.—The “Cicilian Fir” from Asia Minor. A good species for chalky soils. Height 100 ft.

A. concolor.—A very beautiful glaucous-leaved species with purple cones. Native of the western U.S.A. and extends to Mexico.

A. c. candicans.—A form with exquisite silvery foliage.

A. c. pendula.—A form of weeping habit, known as the “Weeping White Fir.”

A. c. violacea.—A very beautiful glaucous-blue foliage form.

A. c. Watzekii.—Resembles *candicans*, but leaves are more elegant, being longer and more slender.

A. Delavayi.—A very beautiful Chinese species, with a white under-surface to the leaves.

A. firma.—A handsome Japanese Fir with large stiff leaves.

A. Forrestii.—“Forrest’s Fir” from western China is one of the most desirable of all the Silver Firs. The leaves are of a lustrous green, milky-white beneath, and the stems are red.

A. Fraseri.—The “Southern Balsam Fir” from the Alleghany Mountains, U.S.A. Height 40–70 ft.

A. grandis.—A fast-growing, W.N. American species of noble proportions. In moist soils will reach to a height of 100 ft. in this country.

A. holophylla.—Native of N. Korea and Manchuria. A handsome species with large leaves, similar to a brachyphylla.

A. Kawakamii.—A new species from Formosa.

A. koreana.—A recently introduced species from the island of Qwel-paert. A small-growing “Silver Fir” which produces cones when only about 6 ft. high.

A. lasiocarpa.—The “Alpine Fir” of W.N. America. A distinct species with grey-green leaves.

A. l. arizonica.—The “Arizonian Fir” with somewhat glaucous leaves.

A. l. cœrulescens.—The most glaucous-leaved form.

A. Lowiana.—“Low’s White Fir” grows wild from S. Oregon to California. Similiar to *A. concolor*.

A. L. glauca.—A form with glaucous foliage.

A. magnifica.—The “Californian Red Fir” has glaucous, slightly-curved foliage, and grows about 70 ft. high. Not successful on chalky soils.

A. m. glauca.—A form with glaucous-blue foliage.

A. mariesii.—“Maries Fir” from Central Japan, where it grows to a height of about 40 ft. Not suitable for chalky soils.

A. nephrolepis.—A new species from N. China and Siberia, resembling *A. siberica*.

A. nobilis.—Aptly named the “Noble Fir,” with its glaucous leaves and large cones, up to 10 in. long. Grows to a height of 200 ft., and is a native of the western U.S.A. Resembles *A. magnifica*, but with a more spreading habit, and like that species, dislikes chalky soils.

A. n. glauca.—A very beautiful, glaucous-blue-leaved form.

A. n. g. prostrata.—A low-growing, horizontally-branched form of the preceding, and excellent for rock-gardens.

A. Nordmanniana.—A beautiful and vigorous-growing “Silver Fir” from the Caucasus. Height up to 200 ft. Best in moist soils.

A. numidica.—The “Algerian Fir” grows up to 70 ft. high, and bears dark glossy leaves. One of the best species for chalky soils.

A. pectinata.—The “Common Silver Fir” of Europe. Succeeds best in districts where there is an abundant rainfall. Height 120 ft.

A. Pindrow.—The “West Himalayan Fir.” A handsome, large-leaved species for mild, moist districts. Height about 200 ft.

A. Pinsapo.—The “Spanish Fir.” A striking species, with very short, blunt leaves. One of the best species for limestone or chalky districts.

A. P. glauca.—A form with glaucous-blue leaves.

A. recurvata.—A new Chinese species with recurving leaves. Is prospering on chalky soil in Hampshire.

A. religiosa.—The "Sacred Fir" of Mexico. A beautiful species, but somewhat tender.

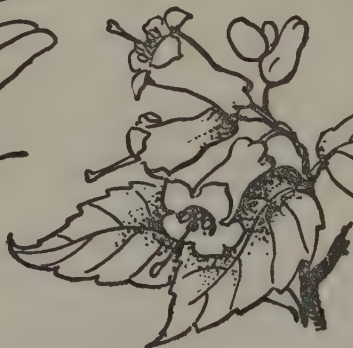
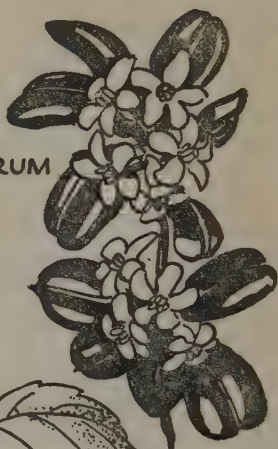
A. sachalinensis.—A slow-growing Japanese species.

A. siberica.—The "Siberian Fir" is a very hardy species and slow growing.



VERONICA

PITTOSPORUM



WEIGELA OR
DIERVILLA.

Flowering shrubs should be planted to form a background to the garden layout

A. Veitchii.—A Japanese species. Not good on chalk. Leaves have a white under-surface.

A. Webbiana.—A somewhat tender species from the Himalayas, with large leaves.

Abutilon (ă-bū-tilon).—Generally regarded as greenhouse plants, but several species may be grown outside in warm districts. *A. vitifolium* is the least tender and is a native of Chile. It bears vine-like, silvery leaves, and very beautiful lavender-blue flowers in summer, resembling a single hollyhock. It likes partial shade, and succeeds against an East wall, but it should be protected from cold winds. It is not a very long-lived plant in some gardens, and a stock should be kept, raised from seed. Cuttings root readily. Spring is the best time for

TREES AND SHRUBS

planting, and good garden soil is suitable. The only pruning it needs is to cut back the young shoots every spring. If this is not done the plants become "leggy."

A. megapoticum (syn. *vexillarium*) is another species which may be grown against a warm wall, south or west. It is a native of Brazil, and grows about 10 ft. high. Its flowers are yellow and red, and they are produced for about seven or eight months without a break.

Acacia (ă-că-cia).—An extensive genus of spring-flowering shrubs or small trees, mostly natives of Australia. As a rule they are grown in cool or quite cold greenhouses, but in warm districts they prosper out-of-doors. At places like Weymouth, Torquay, etc., they attain to tree-like dimensions. The flowers are yellow, very fragrant, and are produced in globular heads very freely. The leaves are very variable and in some species, such as *A. Drummondii*, very beautiful. Certain species produce valuable timber. From *A. catechu*, the drug bearing that name is produced.

Culture.—The plants are sent out by nurserymen in pots, and are best planted in spring, or early autumn. The soil should consist of turfy-loam and leaf-soil in equal parts, and a good sprinkling of silver-sand and some charcoal. They are propagated by cuttings of the tips of half-ripened wood in summer inserted in very sandy soil and placed under a bell-glass in the greenhouse. Pruning consists of cutting back any straggling shoots immediately after flowering. Syringing is very helpful in promoting fresh growth, and an occasional application of weak soot-water is beneficial. The following are suitable for outdoor cultivation.

A. armata.—6–10 ft. Flowers freely in a young state.

A. Baileyana.—One of the best, very useful for cut flowers.

A. dealbata.—The well-known "Mimosa."

A. longifolia.—10 ft. Of bushy habit and very free-flowering. Likes a sandy soil.

A. verticillata.—One of the best species. Very free-flowering.

Acer (ā-ser) Maple.—A very large genus of shrubs and trees, mostly deciduous. Useful for shrubberies and as specimen plants on lawns. The flowers are usually yellow and very decorative, but the foliage is their great charm and makes them valuable for autumn effects. The Japanese maples are the most useful for gardens; the foliage of some of these is perfectly magnificent. They are also valuable as pot plants. They dislike strong winds.

Culture.—Maples are best planted in autumn, and they like a well-drained, loamy soil. Propagation is by layering and budding in August, and by cuttings. Seed may be sown in drills out-of-doors.

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PRINCIPAL SPECIES

A. campestre.—The common maple of the South of England, where it grows to a height of 20–25 ft.

A. circinatum.—The vine-leaved maple of North America. Will reach to a height of about 30 ft. if confined to a single stem, otherwise it forms an attractive, low-spreading bush. Foliage beautifully coloured in autumn. A fine shrub for a lawn.

A. dasycarpum.—The Silver maple of N. America, is a very tall and fast-growing species, of graceful habit. Its leaves have a silvery reverse and are very attractive, especially when the branches are swayed by a breeze.

A. Ginnala.—One of the best for autumn colour.

A. griseum.—A very beautiful Chinese species and one of the finest trees ever introduced into this country. The green leaves have a dove-coloured undersurface, and are gorgeously coloured in autumn. The young bark is orange-coloured, maturing to mahogany.

A. Henryi.—Another Chinese Maple with beautiful autumn foliage.

A. japonicum.—A handsome Japanese Maple, bearing deep-green leaves, becoming brilliant red in autumn.

A. j. laciniatum.—A variety with finely-cut foliage, colouring well in autumn.

A. micranthum.—Another Japanese Maple which colours beautifully in autumn. It is of elegant growth, with red stems, covered with a bluish bloom.

A. negundo.—One of the sugar-yielding Maples of the U.S.A. A fast-growing tree up to about 70 ft. in its native country.

A. opulus.—An Italian Maple with bold foliage and pretty clear yellow flowers. About 50 ft.

A. palmatum.—Native of China and Japan. Generally known as the Japanese Maple. It has been in cultivation in Japanese gardens for centuries. Some very beautiful varieties have been produced from it, among the best being *A. p. atropurpureum*, with fine dark-red leaves in spring and summer, which become bright-red in the autumn. *A. p. septemlobum*, with dazzling-red autumn foliage: and *A. p. s. Osakazukii*, which has deeply-lobed leaves, of shades of vivid scarlet.

A. pennsylvanicum.—A very conspicuous N. American species, known as the Snake-bark Maple. It is very free-growing and will reach a height of 30 ft. The bark is beautifully striped with white, covered with a blue bloom, and is attractive throughout the year. Quite one of the best.

A. pseudoplatanus.—The Common Sycamore or Plane, and is probably a native of Scotland. The tree is very hardy and suitable for exposed situations. A valuable timber tree. Foliage not ornamental in autumn.

A. rubrum.—The Red Maple of North America. 80 ft. It likes a moist position. Foliage not so vivid here as in its native country.

A. rupinerve.—An attractive Japanese species with pale-green bark, striated silver-grey, covered with a beautiful glaucous bloom. The foliage turns to yellow and orange in autumn.

A. saccharum.—The Sugar Maple of East N. America, from which the famous maple sugar is obtained. The leaves turn yellow in autumn in this country, while in its native home the foliage passes to orange, scarlet and crimson.

Actinidia (ac-tin-ĭd-ia).—Hardy leaf-losing climbing shrubs from China, India and Japan, suitable for walls, pergolas, pillars, etc. They produce edible fruits, and the autumn foliage is interesting.

Culture.—Plant in loamy soil. Thin out shoots in February. Propagation is by seed, layers and cuttings.

A. chinensis is the most useful species, and as its name indicates, is of Chinese origin. Flowers yellow, followed by fruits of pleasant flavour and about the size of a large walnut.

Ægle.—The hardy orange. This is a very beautiful and interesting shrub from the far East, and bears orange-like fruits, which make a good conserve, but are too bitter to eat raw. The species most grown is *Æ. sepiaria*. It bears pale, lemon-coloured, fragrant flowers in May, followed by orange-like fruits about 1½ in. across.

Culture.—Plant in early autumn or March, in well-drained, loamy soil and leaf-mould, in a warm, sheltered position. No regular pruning is needed, simply cut out dead wood after fruiting.

Aesculus or Æsculus (ĕs-cu-lus).—The Horse Chestnut. A deciduous flowering tree of handsome form and foliage, and of remarkable beauty when in flower in the spring.

Culture.—Plant in good, deep, well-drained, moist soil, in November. Propagation is by seed, sown 2 in. deep as soon as it falls.

Æ. californica.—The Californian Buckeye is a small-growing tree or bush of about 12 ft. high, and flowers from June to August.

Æ. carnea.—The Red Horse Chestnut is of uncertain origin, and bears deep, rose-coloured flowers.

Æ. hippocastanum.—The Common Horse Chestnut is too well known to need description. It is a native of Northern Greece. There are various forms, the most beautiful being var. *flore pleno*, with double flowers. It carries its flowers over a longer period than the type, and as this variety produces no nuts, it is the best variety for street-planting and public places as it has no attraction for small boys in search of "conkers."

Æ. parviflora is known as the Dwarf Buckeye of the U.S.A., and is a shrub of 8–12 ft., of graceful habit. It bears large panicles of white

flowers in July and sometimes as late as August. An excellent lawn shrub.

Ailanthus, Tree of Heaven.—A very beautiful deciduous Chinese tree, having long, palm-like leaves which turn to a rich yellow colour in autumn. The flowers are of no beauty, but the fruits are decorative.

Culture.—Plant in early November in ordinary garden soil in an open sunny position. Propagation is by taking the root-suckers in August, and planting them in a frame. A very good town tree. Select female trees for this purpose as the male flowers have a very unpleasant smell. For a tropical effect cut the young trees quite close to the ground in spring, and allow only one growth to develop. The result will be magnificent leaves, which will impart quite a sub-tropical appearance. For this a rich, deep soil is requisite.

A. grandulosa is the one generally grown.

A. Giraldei.—A new species with extra large leaves, vivid green.

Akebia (ä-kē-bia).—Very strong-growing climbers from China and Japan, bearing purple flowers. They should be planted in loamy soil. Layering is the best method of increase. *A. quinata* is the best species and bears fragrant purple flowers. *A. lobata* is tender.

Albizzia.—Deciduous, small acacia-like tree, from the Orient and the Far East. Flowers pink or yellow. Requires wall protection. Often used for tropical bedding. Seeds should be sown in warm greenhouse in spring, and the resultant young plants gradually hardened off prior to planting-out in May. *A. julibrissima* is the species usually grown and its pink flowers are very attractive.

Almond.—See PRUNUS AMYGDALUS.

Alnus, Alder.—Deciduous flowering trees and shrubs, valuable for planting in wet situations. Flowers borne on catkins in the spring. Plant during November. Propagation is by seed, and cuttings placed in sandy soil immediately after the fall of the leaves. The principal species are:

A. cordata.—The Italian Alder is one of the most handsome of the genus. Thrives under ordinary conditions in dryish soil, even in chalky districts and away from water. Up to 70 ft.

A. firma.—The Japanese Alder. A very graceful tree, growing up to 30 ft. *A. glutinosa* is the common Alder. Clogs are made from its wood. *A. incana* is the grey alder and is not particular as to soil. *A. japonica*, native of Japan has narrow graceful leaves. *A. sitchensis* bears catkins up to 5 in. long. *A. subcordata* has very large leaves which persist until November.

Amelanchier.—Deciduous flowering, small trees or shrubs of great beauty. Natives of China and parts of America. They all bear white flowers.

TREES AND SHRUBS

Culture.—Plant in October or November in ordinary garden soil. Propagation is by seed sown in March, by cuttings struck in the open in October and by layering the lower branches in spring. Principal species:

A. alnifolia.—A very beautiful and ornamental species from Western N. America. Flowers in May. *A. canadensis* is the Service Berry or June Berry of North America. The first species to produce masses of flowers during April. In autumn the foliage turns to shades of red, and is very beautiful. *A. rotundifolia* is the well known and exquisite Snowy Mespilus of Europe and bears the largest flowers of the genus.

Andromeda, the Wild Rosemary or Bog Rosemary.—Dwarf evergreen shrubs bearing beautiful pitcher-shaped, wax-like flowers in spring. The foliage colours well in autumn. They are easily grown in moist peaty soil. Propagation is by seed and by pegging the shoots into the soil in autumn. They like partial shade and shelter from cold winds. *A. polifolia* is the only species, and there are forms with broad and narrow foliage. It is not related to the true Rosemary.

Aralia.—Handsome deciduous foliage shrubs, much used for tropical bedding, and for growing in pots and tubs. Hardy in most parts of Britain. Plant in November in ordinary garden soil. The richer the soil the larger the leaves, but the plants are not so long lived. They are increased by suckers taken in spring or by root cuttings in autumn. Abundance of water and partial shade are appreciated. The principal species is *A. chinensis*, which bears creamy white flowers followed by black fruits. There are forms with variegated foliage.

Araucaria (ār-āu-kār'i-a).—Chilian evergreen trees belonging to the Coniferæ. *A. imbricata*, the Monkey Puzzle Tree, is the one most grown, and is a tree of unique appearance, and is one of the most remarkable trees introduced into this country. It is easily grown in ordinary garden soil and will reach to a height of 80 ft. Seed is the best means of increase.

Arbutus.—Evergreen trees or shrubs with very attractive dark green foliage and pitcher-shaped flowers, followed by very ornamental fruit. They grow in loamy soil and some peat and are propagated by grafting. The chief species is *A. Unedo*, known as the strawberry tree. It will grow in peaty or chalky soils. The flowers are pinkish-white and appear in autumn and winter, and the strawberry-like scarlet fruits, which are formed the year before, appear at the same time and impart a beautiful and striking appearance to the tree. *A. Menziesii* is a very beautiful species, and bears many very fragrant flowers in May.

Arctostaphylos.—Evergreen shrubs for lime-free soils. Flowers bell-shaped, white or pink, in March and April, followed by red berries. *A. Manzanita* is the chief species, with pink flowers. *A. Uva-ursi* is a trailing species with pink and white flowers in April and May. They thrive in sandy peat, and are increased by seed and by cuttings.

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Aucuba.—Japanese evergreen shrubs with glossy leaves and red berries. First-rate town plants. Plant from October to March. Propagation is by cuttings struck in the open ground in autumn. The plants being unisexual it is necessary to plant both male and female plants, one male to six female varieties is sufficient to ensure a plentiful crop of berries. The principal male varieties are *A. japonica crassifolia* and *A. j. maculata*. The best female varieties *A. j. grandis*, broad leaves, and *A. j. longifolia*, narrow leaves, and the common variegated form *A. j. maculata*.

Azalea. See RHODODENDRON.

Azara.—Hardy or half-hardy flowering shrubs from Chile. They succeed in well drained ordinary garden soil with leaf-mould added. Propagation is by cuttings. The most popular and hardy species is *A. microphylla*. This is a beautiful leaved shrub with vanilla-scented yellow flowers in spring. Fine on a north wall.

Bamboo.—A genus of quick-growing evergreen grasses of great beauty. They are natives of Asia. Of great economic value. They range in height from 1½–100 ft. Bamboos are easily grown in good loamy soil mixed with decayed leaves or cow manure. Plant from October to May, the latter month being the best. They dislike strong winds and should be grown in a sheltered position. The only pruning required is to remove some of the old stems in spring, by cutting them right down to ground level. Propagation is by seed and by division of the plants in early May. Bamboos are divided into three classes, viz. Arundinaria, Bambusa and Phyllostachys, and the following are among the most useful and beautiful.

Arundinaria *B. anceps* is a very hardy and graceful species with plume-like bright green leaves with a glaucous undersurface, 7–15 ft. *B. angustifolia* grows only 2–6 ft. high and is useful as a specimen. *B. falcata* is an elegant slender growing species suitable for warm districts only, 12 ft. *B. fastuosa* is a vigorous growing species with olive-green stems and lustrous green leaves, 15–25 ft. *B. humilis*, a rampant grower of 1–2 ft. only, and is useful as an undergrowth. *B. japonica* is a very hardy and quick growing species and will grow almost anywhere, and in any soil. *B. marmorea* grows only 4 ft. high and is a suitable bamboo for the rock garden. The canes are purple and the leaves brilliant green. *B. nitida*, known as “The Queen of Bamboos,” is a very beautiful and hardy species, with slender arching cane and soft green leaves. Will grow in chalky soil, but needs abundance of water.

Of Bambusa, *quadrangularis* is the most distinct, but is tender.

Among the Phyllostachys, *Castillonii* is one of the best, with yellow stems and green and yellow leaves, 6–10 ft. *B. Henonis* is also a very

TREES AND SHRUBS

fine species, one of the most beautiful, having luxuriant dark green foliage, glaucous beneath, 8-12 ft. *B. mitis* is a very fast growing species with pale yellow canes and dark green leaves. *B. nigra* is a slow growing species, having olive-green canes which turn to black the second year. The foliage is dark green. *B. viridi-glaucescens* is a hardy, vigorous species, having bright green canes and beautiful glaucous green foliage.

Barberry. See BERBERIS.

Bay. See LAURUS NOBILIS.

Beech. See FAGUS.

Berberis.—Very useful and ornamental evergreen and deciduous flowering shrubs, of easy cultivation in ordinary garden soil. Plant in autumn or spring. Propagation is by seed, and cuttings inserted in a frame in August. Among the numerous species the following are recommended. They all have yellow flowers and berries of red, purple or black. *B. brevipaniculata*, very beautiful in leaf and berry, 4-6 ft. *B. concinna* bears carmine red berries and the foliage turns to a brilliant colour in autumn. *B. Darwinii*, a great favourite, will grow in semi-shade. Flowers orange yellow and dark blue berries. *B. Sargentiana* is one of the most beautiful. Its large handsome leaves turn to scarlet and bronze in autumn. Berries black. *B. stenophylla* bears long arching sprays of deep yellow flowers and narrow leaves. It is useful as a specimen, in groups, as a hedge and for covering sloping banks. *B. Thunbergii* bears lovely yellow flowers, succeeded by brilliant red berries. Foliage scarlet in autumn. Will grow 8 ft. high and 12 ft. across. *B. Wilsonæ* is one of the finest both in flower and berry. The neat leaves become brilliantly tinted in autumn, while the cream-coloured berries gradually change to pink and later to bright coral. 2-4 ft. The Mahonia section includes *B. aquifolium*, the popular dark glossy green-leaved species, with fragrant golden-yellow flowers, and violet-black berries. *B. a. japonica* is an evergreen species with large leaves and fragrant, lemon-yellow flowers from February to March. *B. pinnata* is a handsome Mahonia, having deep green foliage and rich yellow flowers from February to April. 8-12 ft. Suitable for shady places.

Betula (Birch).—A genus of very elegant and beautiful deciduous trees and shrubs, with attractively coloured stems. They thrive in ordinary garden soil, and in poor gravelly ones. Plant in November. Some of the best are *B. Ermanii*, with coffee-coloured trunk; *B. japonica*, silvery white to orange; *B. lenta*, almost black; *B. Maximowiczii*, brown, becoming silvery, leaves very large; *B. nana* grows 2-4 ft.; *B. nigra* thrives in damp soil; *B. papyrifera*, very white bark, from which Canadian canoes are made; *B. verrucosa* is the common Silver Birch.

Bilberry (*Vaccinium myrtillus*).—The Bilberry or Whortleberry is a low-growing, deciduous shrub, and bears delicious berries or fruits,

much used for tarts, pies, etc. It thrives in any non-limy garden soil mixed with peat, and is increased by suckers.

Broom. See CYTISUS, GENISTA and SPARTIUM.

Buddleia.—Evergreen and deciduous flowering shrubs of considerable garden value. They are of easy cultivation in ordinary garden soil, and may be planted in spring or autumn. Propagation is by cuttings about 4-5 in. long, cut under a joint and inserted in pots of sandy soil, or they may be struck in the open ground in late summer. The *variabilis* section should be pruned back to about 10 in. after flowering or in the spring, or the plants will become straggly and the flower spikes small. There are a number of species and varieties, and the following are the most useful: *B. alternifolia* has fine willow-like leaves and bears sprays of fragrant purple flowers in late spring and early summer. *B. globosa*, known as the Orange Ball Tree bears fragrant bright orange-coloured flowers arranged in round heads which from a distance look like minute oranges. This species is not pruned like the others, but if the bush gets straggly it may be cut back every other year. *B. variabilis* var. *amplissima* bears spikes of deep mauve, and *B. v. var. magnifica* has dark purple flowers.

Buxus (Box).—Evergreen shrubs and trees which will grow in any soil and aspect. Plant in April or September. The necessary clipping should be done in May and August. Propagation is by cuttings taken in August or September, and placed under a bell-glass. Among the most useful species and varieties are *B. balearica* with larger leaves than others, like a glorified common Box. *B. Harlandii* is a compact growing Box about 3 ft. high. *B. sempervirens*, the Common Box, is much used for edging and topiary work. There are a number of varieties of this, such as *B. s. aurea maculata*, with the leaves mottled yellow, and its weeping form, *B. s. a. pendula*; *B. s. latifolia*, with broad leaves; *B. s. myosotifolia*, with small leaves of glaucous green, there is also a pendulous form of this *B. s. pendula*; *B. s. rosmarinifolia*, very dwarf, with rosemary-like leaves; and *B. s. suffruticosa* used for Box edging. In Nature this grows to about 4 ft. high, and is kept dwarf by persistent clipping. It is easily increased by division and by cuttings.

Callicarpa.—Deciduous flowering and berry bearing shrubs, which thrive in good garden soil, and grow about 4-5 ft. high. *C. Giraladiana* is one of the best species and bears violet-blue berries. *C. japonica* and *C. purpurea* are also grown.

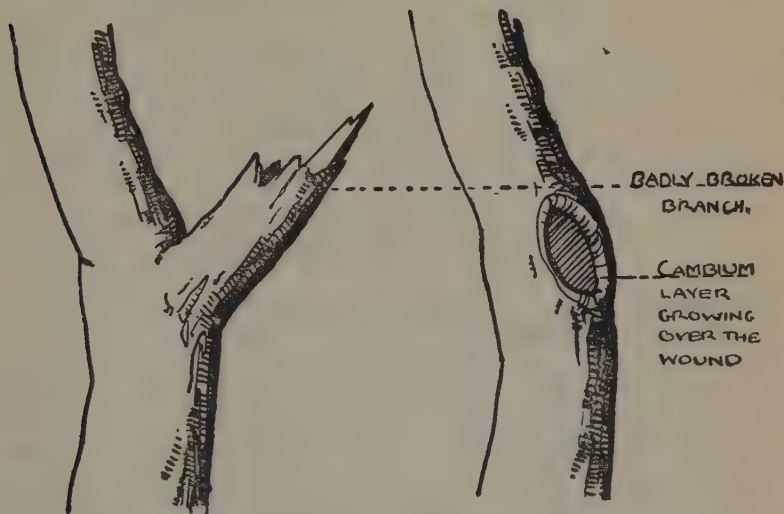
Calluna (the Ling of England and the Heather of Scotland).—It is distinguished from *Erica* proper by the large, coloured calyx (the outermost whorl of leaves in a flower) with four minute bracts (a bract is a modified leaf) at its base. For culture see ERICA. There is only one species *C. vulgaris*, of which the following varieties are among the most

TREES AND SHRUBS

useful for gardens: *C. v. Alportii*, bright crimson; *C. coccinea*, crimson; *C. v. darleyensis*, deep pink; *C. v. flore pleno*, double pink; *C. v. H. E. Beale*, double silvery pink, very distinct and beautiful; *C. v. alba*, white; *C. v. a. Hammondii*, taller growing, and *C. v. a. Serlei*, late flowering.

Camellia.—Very beautiful evergreen flowering shrubs and trees, with glossy foliage and single and double flowers. Natives of China and

TREE SURGERY



A broken branch should be sawn off right back to the trunk and the wound painted with Stockholm Tar

Japan. They are hardy in most gardens and are now becoming popular again. Camellias like a peaty soil, but they do quite well in lime free loam if leaf-mould or peat and some sand are added at planting time to give them a start. They like semi-shade and sheltered positions and a fair amount of moisture or the buds may drop. Propagation is by grafting on to seedlings of *C. japonica* in spring in a close propagating frame. Cuttings will also root if inserted in pots of sandy peat in August and kept in the greenhouse. They may also be layered at the end of August or September. The principal species are *C. cuspidata*, with single white flowers $1\frac{1}{2}$ in. across during May and *C. japonica*, with red flowers. Of this there are a number of varieties, among the best being *C. j. Donckelaarii*, with flowers of deep red, with white markings; *C. j. Lady Clare*, one of the most beautiful, with large pink flowers; *C. j. latifolia*, semi-double bright red flowers. The finest species is *C. reticulata*, but it is

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only for mild districts. It bears semi-double flowers from 5-9 in. across of a beautiful glowing rose crimson colour. *C. thea* is the Tea Plant and is of more economic importance than of floral beauty. The small white fragrant flowers are only about 1 in. across. Not very hardy.

Carpentaria.—Evergreen shrub, bearing pure white anemone-like flowers in June and July. Rather tender, needing wall protection, except in sea-side gardens. It likes plenty of humus in the soil and abundance of water. Propagation is by seed sown in pots of sandy soil in the greenhouse, or frame. *C. californica* is the only species.

Carpinus.—Deciduous trees known as Hornbeam. They thrive on poor soils, and in chalky districts. Useful for hedges and for planting in parks. Plant from November to February. Increased by seed sown in the open, and by grafting in March. The most generally grown species is *C. betulus*, the Common Hornbeam, which is sometimes mistaken for a Beech, but is more graceful in appearance. The variety *pyramidalis* is the best.

Carya.—Fast-growing deciduous trees of graceful habit and very attractive foliage. Ordinary garden soil. The principal species are *C. cordiformis* and *C. pecan.*

Castanea sativa (the Sweet Chestnut). See after CERCIS.

Catalpa.—Hardy, deciduous flowering trees with large attractive foliage and beautiful Gloxinia-like flowers. They like well-drained loamy soil and a sunny position and may be planted from November to February. Propagation is by seed and cuttings struck in gentle heat. The most popular species is *C. bignonioides*, which bears white flowers, inside yellow and purple, freely produced in large clusters during July and August. An extremely beautiful tree and should be in every garden. There is a variety *C. b. aurea* with rich yellow leaves.

Ceanothus.—Evergreen and deciduous flowering shrubs with flowers of white, pink and blue from April to August. The deciduous species are generally hardy, but the evergreen species need the protection of a wall or fence. They may be planted in autumn or spring in ordinary garden soil, in sunny positions. They are best planted from pots. Pruning consists in shortening the growths of the spring-flowering species directly after flowering. Those which flower in the autumn, such as *Gloire de Versailles*, should be trimmed only, to keep them in shape; unless grown on walls when they may be cut back to 2 in. of the old wood in spring. Of the Evergreen Section *C. dentatus* bears bright blue flowers from June to August. *C. papillosus* is a beautiful species with pale blue flowers, and needs wall protection. *C. thyrsiflorus* is very hardy and grows up to 30 ft. and bears powder-blue flowers during May and June. Among the Deciduous Section the hybrid *Gloire de Versailles* is the most popular, with its large panicles of azure blue flowers borne from June to October.

TREES AND SHRUBS

Cedrus (Cedar).—The grandest of all Conifers. They succeed in deep, well-drained, moist loamy soil. Propagation is best by seed sown in the greenhouse in spring. *C. atlantica* is a very beautiful tree of spreading habit, and needle-like leaves. There is a variety with yellowish foliage and one with glaucous foliage. *C. deodara* is of graceful habit with grey-green foliage. *C. Libani*, the "Cedar of Lebanon," is a tree of unsurpassed distinction and historical interest.

Ceratostigma.—Deciduous flowering shrubs bearing beautiful blue flowers from July to late autumn. They like a sunny position in well-drained soil. Propagation is by seed and cuttings. *C. Willmottianum* is the finest species.

Castanea sativa.—The Sweet Chestnut is a valuable tree to grow as a specimen, in light sandy soil. Plant from October to March.

Celastrus. See CLIMBING PLANTS.

Cercis.—Deciduous trees, bearing pea-shaped flowers in May, before the leaves unfold. They should be planted in May as soon as growth commences, in moist deep sandy loam in a sunny position. Propagation is by seed. *C. siliquastrum*, popularly known as the Judas Tree, is the one generally grown. 30–40 ft.

Cherry. See PRUNUS.

Chimonanthus fragrans is a hardy deciduous shrub bearing deliciously fragrant flowers during December and January. Plant in October or March in loamy soil in a very sunny sheltered position, such as a south wall. Propagation is by layering in August. Pruning consists of cutting out the weaker stems, and shortening the strong-growing shoots, after flowering.

Choisya ternata.—A beautiful Mexican evergreen shrub, bearing fragrant white flowers from December to spring. Useful as a hedge in mild districts, but is best grown against a sunny wall. Plant in ordinary garden soil in April or September.

Cistus (the Rock Rose).—Hardy and half-hardy flowering shrubs thriving in poor dry soil in sunny positions. The flowers are produced very profusely and resemble single roses. They should be planted from pots as they are difficult to transplant. Propagation is by cuttings in August, placed round the edge of a pot of very sandy soil and kept in a frame or greenhouse. The most useful are the following: *C. crispus*, bright pink; *C. cyprius*, white, blotched crimson; *C. ladaniferus*, large white flowers, crimson blotch; *C. l. immaculatus*, pure white; *C. Loreti*, white with purple blotch.

Clematis. See CLIMBERS.

Cornus.—Hardy deciduous trees and shrubs with white or yellow flowers. Plant in autumn or spring in ordinary garden soil, in open position. They like moisture. The principal species are: *C. capitata*,

best in mild districts; *C. Kousa*, fine autumn foliage; *C. Mas*, the Cornelian Cherry, yellow flowers in March, and *C. Nuttallii*, the most handsome of all, with large creamy white flowers about 4 in. across; *C. canadensis* is a creeping species only a few inches high with white flowers and orange-coloured fruits.

Cotoneaster.—Deciduous and evergreen flowering and berry-bearing shrubs and trees. They are of the easiest cultivation in ordinary soil. Propagation is by cuttings of half-ripened wood about July. Of the deciduous species, *C. bullata* is one of the finest, with beautiful autumn foliage and brilliant red berries. *C. frigida* has large crimson berries, and is excellent in town gardens. *C. Simonsii* is an excellent hedge plant, with dark green leaves, tinted red and bright red fruits. Among the Evergreen species, *C. aldenhamensis* is a beautiful tree, bearing bright red berries, and handsome foliage. *C. rotundifolia* bears the largest scarlet berries, which persist throughout the autumn and winter. *C. horizontalis* and *C. Dammeri* are trailing species suitable for rock gardens and steep banks.

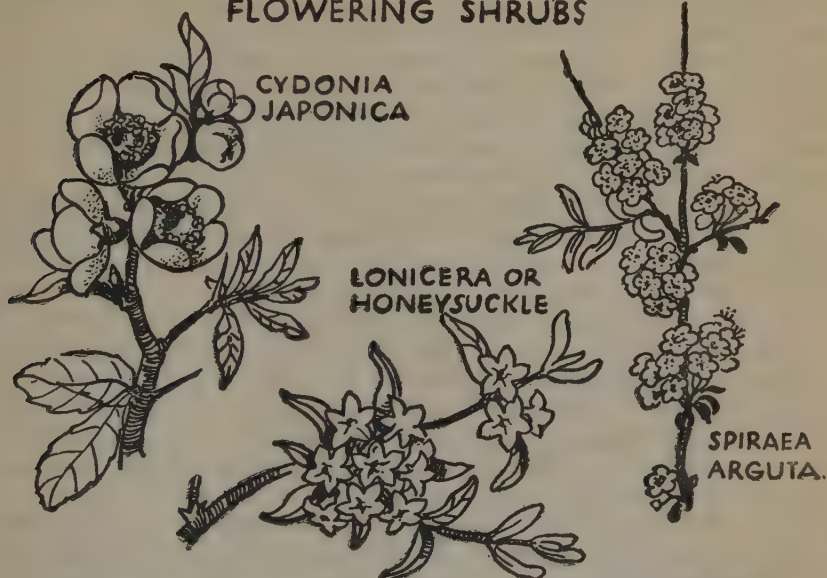
Cratægus.—Deciduous flowering and berry-bearing trees, easily grown in ordinary soil. Plant in autumn. Among the most beautiful are *C. cordata*, which is very attractive in autumn with its orange and scarlet foliage and bright scarlet fruits. *C. crus-galli*, the Cockspur Thorn, is a striking tree with brilliant foliage and berries. *C. oxyacantha*, our native "May," or "Quick," and its sub-species *praecox*, known as the "Glastonbury Thorn," and *C. prunifolia*, with its large rich fruits, are also useful.

Cupressus (Cypress).—Evergreen trees of great beauty and of diverse habits, ranging in height from a few feet up to 200 ft. They like a cool rich loam or peaty soil, in sheltered positions as a rule. Plant in April or September. One of the best known is "Lawson's Cypress," *C. Lawsoniana*, which grows to 200 ft. high, and is the hardiest and most generally useful. May be planted in exposed positions and in the shade of other trees. It prefers a moist climate. *C. L. argentea* is of more compact habit and has silvery-grey leaves. *C. filifera* is of pendulous habit and makes a good specimen tree for a lawn. *C. macrocarpa* is a fast-growing hardy species, and is seen at its best in seaside gardens, where it is much used as a hedge. The hedge should be trimmed or clipped in April, never in the autumn or winter. If grown as a specimen it must be staked owing to its rapid growth. Height 40–60 ft. Among the dwarf forms for rock gardens, etc., the following are recommended: *C. L. Allumii*, of conical habit and glaucous blue foliage; *C. L. erecta aurea*, a pyramid of bright gold; *C. L. Fletcheri*, a pyramid of glaucous blue; *C. L. F. nana*, a very dwarf form for small rock gardens; *C. L. Pottenii*, soft silver green, of elegant pyramidal habit.

TREES AND SHRUBS

Cydonia (Quince).—Deciduous, spring-flowering shrubs. Plant in good garden soil in October or November. Propagation is by seed, cuttings, layers and suckers. The most useful species is *C. japonica*, which likes a sunny position and flowers from December to May; and its finest form is Knap Hill Scarlet. This bears bright orange-scarlet

FLOWERING SHRUBS



Include in your shrub border a few varieties which will provide cut flowers for the house

flowers, 3 in. across; 3 ft. *C. Maulei* bears flowers of orange-flame colour and *C. M. Simonii* has dark crimson flowers. *C. vulgaris* is the common Quince, and produces very beautiful pink and white flowers in May, followed by its fragrant golden fruits; so much appreciated for making tarts and jelly.

Cytisus.—Hardy deciduous flowering shrubs, of very diverse habit of growth, ranging in height from a few inches up to about 14 or 15 ft. Plant in ordinary soil in October. The spring flowering species should be pruned directly after flowering to prevent legginess; while the late-flowering may be left until February. Propagation is best by seed. Cuttings may be taken in August, about 2-3 in. long with a "heel" and inserted in pots of very sandy soil and placed in a frame or under a bell-glass. The following are the most beautiful: *C. albus*, 7 ft. The White Portugal Broom, bears masses of white flowers in May; *C. Beanii*, deep golden yellow, 1 ft.; *C. Dorothy Walpole*, crimson and rose; *C. nigricans*, 3 ft., yellow, July to October; *C. praecox*, one of the finest, sulphur-

yellow, May; *C. scoparius*, is the common Broom, too well known to need any description, but not half enough appreciated. The form known as *Andreanus* has rich crimson and yellow flowers, and Firefly bears fiery red flowers suffused with yellow; *C. decumbens* is a trailing species with rich yellow flowers in May and June and is ideal for the rock garden.

Daboecia.—The Irish Heath is one of the most valuable of dwarf flowering shrubs, and should be in every garden where the soil is lime free. It grows about 12–18 in. high, and bears spikes of large bell-shaped flowers from about June until frost. Beautiful as cut flowers, and the more they are cut the more freely they bloom. All dead flower spikes should be removed, and the plants pruned over in spring. The best form is *D. polifolia purpurea*. *D. p. alba* is also very beautiful.

Daphne.—Hardy evergreen and deciduous flowering shrubs, bearing very fragrant flowers. They like a peaty soil, or sandy loam and leaf-mould. Plant in autumn or spring. The most useful evergreen species is *D. cneorum* with very fragrant pink flowers in May, 1 ft. *D. mezereum* is a deciduous species bearing fragrant purple blooms early in the year.

Deutzia.—Hardy, deciduous flowering shrubs. Plant in autumn in well-drained garden soil in semi-shade. Cut away old and weak wood after flowering. Propagation by cuttings in June. The best are *D. corymbosa*, white July and August; *D. kalmidiflora*, white and carmine, May; *D. longifolia*, rich purple-rose, one of the finest; *D. mollis*, white, June; *D. scabra magnifica*, double white.

Diervilla.—Beautiful hardy deciduous flowering shrubs, popularly known as Weigelas. They may be grown against fences or in shrubberies, and make attractive lawn specimens. Plant in October or November in good garden soil. Thin out straggly shoots in winter. Propagation is by cuttings in June. The hybrids are the most useful, such as *D. hybrida Abel Carriere*, bright rose; *D. h. Avantgarde*, pink; *D. h. Eva Rathke*, crimson; *D. h. Mont Blanc*, white.

Elder. See **SAMBUCUS**.

Erica (Heath).—This is such a large genus that only a few of the most notable species and varieties can be enumerated. With the exception of *carnea*, *mediterranea*, *darleyensis*, *cinerea* and a few others, heaths will not thrive in chalky soils. They like a sandy peat, or sandy loam and leaf-mould. Avoid rich soils. Cut back the plants after flowering. They are increased by seed sown in very sandy peat in spring, and by cutting about $\frac{1}{2}$ –1 in. long in July and August. If convenient get the soil from a district where the plants grow wild, which contains the parasite which is essential to the plant's welfare. The following are recommended. *E. arborea*, a true heath 6–15 ft., fragrant white flowers in spring. Briar pipes are made from the roots of this species. *E. australis*, 3–4 ft., bright rose. *E. a. Mr. Robert*, pure white.

TREES AND SHRUBS

E. carnea, deep red. *E. c. Cecilia* M. Beale, white. *E. c. Vivellii*, carmine. *E. ciliaris*, the Dorset heath, bears flowers of rich clear pink from July to October. *E. c. Maweana* is the best form with rosy-crimson flowers from July to November. *E. cinerea* is the Scotch heather; in England it is called ling. *E. c. atrorubens* is a distinct variety with ruby-red flowers. *E. c. Mrs. Dill*, pink, only 6 in. high. *E. c. alba*, the white Scotch heather. *E. darleyensis*, a fine hybrid of cushion-like habit and rosy-red flowers throughout the winter. *E. hybrida* H. Maxwell, bright pink. *E. lusitanica*, a white-flowered tree heath, 6 ft. *E. mediterranea*, honey-scented pink flowers, March to May, 4-10 ft. There is a white form, and a very fine Irish variety called Brightness, with bright red flowers. *E. stricta*, bright rose, thrives in calcareous soils. *E. tetralix*, rose, will grow in very wet ground. *E. vagans*, the Cornish heath, pinkish rose. The best variety is Mrs. Maxwell, deep cerise, and the finest white variety is Lyonesse. *St. Keverne*, rose pink, is also excellent, and makes a fine edging, 6-12 in.

Escallonia.—Evergreen hardy and half-hardy flowering shrubs, useful for planting against walls and fences. They thrive in ordinary garden soil, not rich. In seaside districts they form beautiful hedges. Propagation is by cuttings in August. *E. macrantha* is the most popular species, with glossy leaves and rosy-red flowers from July to November. *E. Philippiana* has white flowers. The most useful hybrids are C. F. Ball, carmine; Donard Beauty, rose-red; Donard Gem, pale pink; *Exoniensis*, white tinted rose, very hardy.

Eucalyptus.—Hardy and half-hardy shrubs of rapid growth. The flowers are more peculiar than beautiful, except those of *E. ficifolia*, which bears magnificent scarlet flowers; and *E. leucoxydon* with beautiful rose-coloured flowers. These are for very mild districts only and the cold greenhouse. The Eucalyptus will grow in quite poor soil. Plant out from pots at the end of May. Propagation is by seed. The hardiest species are *E. coccifera*, *E. globulus*, *E. Gunnii*, and *E. urnigera*.

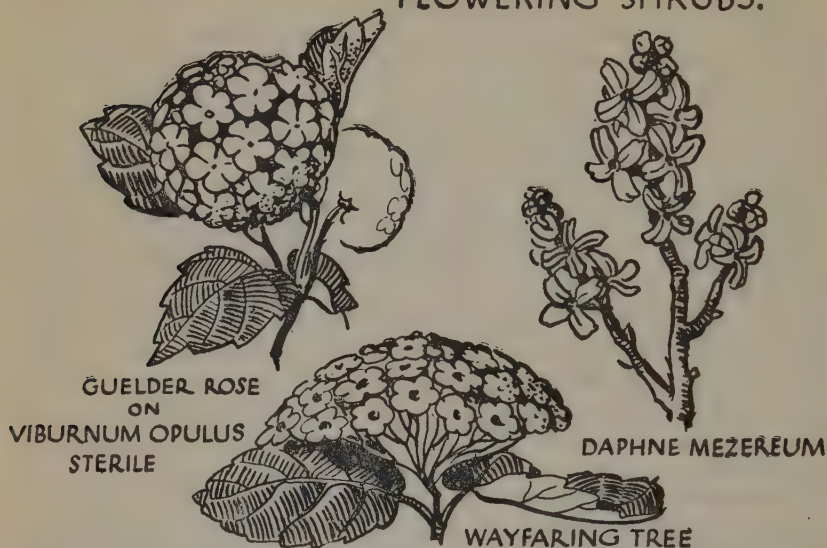
Euonymus.—Hardy evergreen and deciduous shrubs of no floral beauty but valuable for their attractive autumn foliage and fruits. The evergreen section should be planted in April or October and the deciduous species from November to March. Propagation is by seed and cuttings. Of the deciduous section *E. alatus* is one of the most beautiful of shrubs for foliage effect in autumn, the leaves turning to pink and then to crimson. *E. europæus*, the native spindle wood, is effective in late autumn in foliage and fruit. *E. latifolius* and *E. sanguineus* are also good for rich autumn colour effect. Among the evergreen section *E. japonica*, *E. lancifolius* are recommended. *E. radicans* is a creeping species and is used for covering poor ground under trees, and as edgings. There is a silver-leaved form.

Fagus.—The Beech is too well known to need description. It thrives best on calcareous soils, and in coastal districts. Plant in October

or November. Propagation is by seed, and for named varieties by grafting. *F. sylvatica* is the common beech. The variety *atropurpurea* is the darkest leaved purple-leaf variety, and *heterophylla* is a handsome variety with fern-like foliage.

Fatsia japonica is popularly known as *Aralia Sieboldii*. It is

FLOWERING SHRUBS.



Many of the flowering shrubs are scented, and are well worth their place in the garden for this alone

perfectly hardy and thrives in any ordinary soil, light or heavy. Propagation is by cuttings.

Forsythia.—Hardy, deciduous flowering shrubs of great beauty and usefulness in the garden in spring, and for forcing. Plant in autumn in good garden soil. Cut well back after flowering. Take cuttings in June and July. The finest species to grow as a specimen is *F. intermedia spectabilis*, 6–10 ft., with its clouds of golden yellow flowers during March and April. For growing against a wall or fence *F. suspensa* is the one to choose.

Fraxinus (Ash).—Deciduous trees of very quick growth and valuable for timber. Plant in November in rich soil, containing a good quantity of chalk or lime in some form. Propagation is by seed. The principal species are *F. americana*, a good timber tree; *F. angustifolia*, narrow leaves; *F. excelsior*, the Common Ash; *F. floribunda*, a large-leaved species for mild districts. Perhaps the most beautiful Ash is *F. Mariesii*

with large panicles of creamy-white flowers, followed by purple fruits 1 in. long.

Gaultheria.—Dwarf growing evergreen shrubs, bearing sprays of small white or pink flowers followed by fruits of various colours. Valuable for planting under trees where few other plants would thrive. Plant in lime-free soil and propagate by division. The most striking species is *G. trichophylla*, which is quite prostrate, and bears small pink flowers, followed by bright blue fruits about the size of a sparrow's egg. For planting under trees to form a carpet, *G. procumbens*, red berries, and *G. shallon*, purple berries, are the most suitable.

Genista (Broom).—Deciduous flowering shrubs, from a few inches to upwards of 20 ft. in height. All have pea-shaped yellow flowers except *G. monosperma* which has milky-white flowers. They like a dry, light soil in full sun. Thin out the old wood after flowering, except *aetnensis*, *cinerea* and *virgata*, which only need "pinching" or "stopping" to keep them in shape. Propagation is by seed sown in frames and by cuttings in August. The principal species are: *G. aetnensis*, 15–20 ft.; *G. hispanica*, 2 ft. and *G. virgata*, while *G. pilosa* is a small procumbent species for rock-gardens and dry banks.

Hamamelis.—The Witch Hazels are deciduous shrubs and trees valuable for their fragrant yellow flowers in winter and early spring. Plant in October or November in moist, well-drained loamy soil with peat or leaf-mould. Propagation is by seed, grafting and layering. The handsomest species is *H. mollis* which bears rich golden yellow, very fragrant flowers from December onwards. The leaves turn yellow in autumn. *H. japonica* *Zuccariniana* bears pale yellow flowers and has very beautiful foliage in autumn.

Hawthorn. See CRATAEGUS OXYCANTHA.

Hedera. See CLIMBERS.

Hippophæ rhamnoides.—The well-known Sea Buckthorn has greyish-green leaves, inconspicuous flowers in April followed by orange-coloured berries. Both sexes must be planted to obtain a good crop of berries.

Horse Chestnut. See ÆSCULUS HIPPOCASTANUM.

Hydrangea.—Deciduous hardy and greenhouse flowering shrubs. Those generally grown in gardens are *H. hortensis* and *H. paniculata*, and their hybrids. *H. aspera macrophylla* is a very fine species with pale blue flowers; *H. hortensis* bears pink or blue flowers. It should be planted in a lime-free soil and watered freely with a solution of alum, one teaspoonful to the gallon of soft water; or with 3 oz. of aluminium sulphate to 1 gal. of water. *H. paniculata* bears very large heads of yellowish-white flowers. It should be planted in good soil and the young shoots thinned out in spring.

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Hypericum.—Deciduous and evergreen flowering shrubs easily grown in ordinary soil. And as easily propagated by seed, cuttings or division of the plants. The best known species is *H. calycinum* or "Rose of Sharon," with evergreen foliage and bright yellow flowers from June to October, 12–15 in. *H. Hookerianum* is a fine deciduous species with bright yellow flowers, and *H. Moserianum* is a beautiful hybrid with large golden yellow flowers.

Ilex (Holly).—Too well known to need any description. A magnificent hedge plant. The sexes being on different plants as a rule, it is necessary, if a good crop of berries is desired, to grow male and female varieties. Planting is best done in May or September in well-drained, loamy soil. Pruning is done in April when necessary. Hedges are pruned in May or August. Propagation is by seed sown in the open about March, and they germinate the following year. Cuttings may be taken in August. The principal species is *I. aquifolium*, the Common Holly, of which there are many varieties. One of the most beautiful is *I. a. Camelliaefolia*, with Camellia-like leaves and very large red berries. Other varieties have different shaped leaves, some with variegated leaves of gold and silver. *I. a. Hendersonii* has smooth leaves and is very free berrying. *I. latifolia* is a handsome species with enormous leaves. *I. Pernyi* is a slow-growing species of pyramidal shape.

Jasminum. See CLIMBERS.

Kalmia.—Hardy evergreen flowering shrubs for peaty soils, or lime-free loam and leaf-mould. *K. latifolia* is the finest species, and is one of the most beautiful of all flowering shrubs. Its bright pink flowers are borne in large clusters in May and June, 4–6 ft.

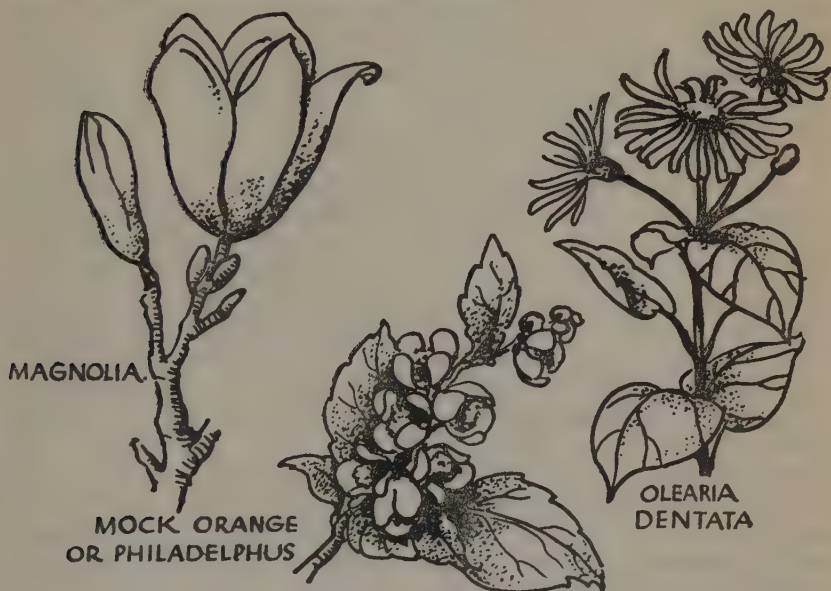
Kerria japonica is a hardy deciduous shrub with yellow flowers. Suitable for a north wall.

Laburnum.—Hardy deciduous trees bearing pea-shaped yellow flowers in May and June. Plant in November in ordinary garden soil. Pick off all seed pods as soon as formed. Propagation is by seed and by budding and grafting. *L. vulgare* is the Common Laburnum of which *L. v. Vossii* is the finest form. *L. v. pendulum* is a graceful "weeping" variety.

Larix.—The Larch is a tree of ornamental and graceful appearance and considerable economic importance owing to the high quality of its timber. Larches are particularly attractive in spring when the young shoots of a soft pale green appear, followed by fascinating red flowers, to be succeeded by glaucous coloured cones. Larches like a well-drained loam soil and plenty of moisture. They are increased by seed, and the choice varieties by grafting. The best-known species is *L. europæa*, the Common Larch. *L. leptolepis* the Japanese Larch is a very distinct species. *L. Potaninii* is a very beautiful Chinese Larch.

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Lavandula.—The lavender is an evergreen shrub, famous for its exquisitely scented flowers. Makes a delightful hedge. Plant in sunny positions. Cuttings and branches root readily. *L. spicata* is the old English lavender, of which the following varieties are recommended *L. s. gigantea*, 3 ft., late flowering; and *L. s. nana* or the Munstead variety, which grows only 1 ft. high and bears dark flowers.



Here are three useful flowering shrubs for the small garden: *Magnolia* blooms in early spring, *Mock Orange* is sweetly scented, and *Olearia* will grow in town gardens

Ligustrum (Privet).—Hardy evergreen and deciduous shrubs, which thrive in any garden soil, and are easily increased by cuttings. *L. vulgare* is the well-known Common Privet. *L. v. variegatum* is a golden variegated form. Other species grown in gardens are *L. Delavayanum*, evergreen, 5 ft. *L. lucidum*, evergreen. *L. l. excelsum superbum*, evergreen, gold and silver variegated leaves. *L. Quihoni* deciduous and one of the best flowering privets.

Lonicera (Honeysuckle).—See CLIMBERS for climbing species. The most useful erect species of honeysuckle are *L. nitida*, *L. pilata* and *L. p. yunnanensis*. These have small, dark, glossy leaves, and make beautiful close hedges. They are very easily propagated by cuttings pressed into the soil at any time.

Magnolia.—Magnificent evergreen and deciduous flowering shrubs and trees of great distinction. They are easily cultivated. Spring is

the best time for planting just when the leaf buds are moving; they must never be moved while dormant. They like semi-shade and a deep loamy soil, and peat or leaf-mould may be added, especially for *M. parviflora* and *M. stellata*. Propagation is by seed sown as soon as ripe, and by layering. The following are some of the finest species: *M. conspicua*, pure white flowers in March. *M. glauca*, very fragrant creamy white, flowers from June to September; *M. grandiflora*, has huge glossy leaves and creamy white flowers 8 in. across; *M. Lennei*, a hybrid with rose-purple flowers during April and May and again in the autumn. *M. parviflora*, drooping pure white fragrant flowers from May to September. *M. soulangiana*, white, stained purple from April to June. *M. stellata*, fragrant, pure white March and April.

Myrtus.—The Myrtle has been a favourite shrub from earliest days. It is only suitable for mild districts or against warm walls or fences. Thriving in good garden soil in sunny positions. Propagation by cuttings, placed in greenhouse or frame. *M. communis* is the Common Myrtle. *M. luma* produces its fragrant white flowers from July to September. *M. Ugni* is one of the treasures of the garden with its sweet waxy pink flowers and red berries.

Olearia.—Hardy and half-hardy evergreen shrubs which bear clusters of white daisy-like flowers during July and August. Easily grown in light non-calcareous soil. Propagation by cuttings. The most popular species is *O. macrodonta* with its grey holly-like leaves and heads of white flowers in June. A good hedge plant for mild districts. *O. Forsteri* has fragrant white flowers, and *O. ilicifolia* bears musk scented flowers. For very mild districts *O. semidentata* with mauve flowers is recommended.

Osmanthus.—Handsome evergreen shrubs with attractive foliage and clusters of white or yellow flowers. Of easy culture in loamy soil. Propagation is by cutting taken in July. The most useful species is *O. aquilifolium* (*ilicifolius*) with polished holly-like leaves and sweet scented flowers in autumn. *O. Delavayi* is a handsome plant with Jessamine scented flowers. Likes a half shady position.

Passiflora. Passion Flower.—See CLIMBERS.

Philadelphus.—Deciduous flowering shrubs popularly called "Mock Orange" owing to their very fragrant blossoms. Of easy cultivation in ordinary garden soil. Propagation by cuttings in greenhouse. The hybrids are the most useful for general garden purposes, such as *Avalanche*, *Boule d'Argent*, double; *Favorite*, very fine; *Virginal*, double. *P. microphyllus* is a dwarf species, 3 ft., and bears small very fragrant white flowers, stained purple.

Picea (the Spruce Fir).—Handsome evergreen trees belonging to the Coniferæ. They thrive in most soils, but prefer deep sandy loam, and

TREES AND SHRUBS

pure country air. Propagation by seed sown out of doors in spring. There are numerous species and varieties. *P. alba* is very hardy, 60–100 ft. *P. Breweriana* of pendulous habit. *P. Engelmannii* of pyramidal habit. *P. excelsa* is the Common Spruce or “Christmas Tree” 150 ft. There are dwarf forms of this, the best being *P. e. Clanbrassiliana* which takes 30 years to grow about 3 ft. *P. e. Gregoryana* grows 1 in. in a year. *P. e. nana* quite a pygmy. *P. e. pyramidalis* forms a beautiful specimen for small gardens, 15 ft. *P. e. Remontii*, of dwarf conical habit. *P. Morinda*, very graceful, 100 ft. *P. nigra*, will grow almost anywhere, 20–30 ft. *P. Omorika* an elegant growing Spruce up to 100 ft: one of the few which do well in or near large towns. *P. purpurea* *Kosteriana* has very beautiful blue foliage. Dwarf. *P. p. Spekkii* is a silvery blue form.

Pinus.—The Pine is the most important of all the Conifers, and of great economic value for its timber, turpentine, etc. The leaves are generally in clusters of from 2 to 5. The flowers are also borne in clusters and the “cones” or fruit are formed from the female flowers. Plant in September or May. They thrive in most soils, but prefer a light sandy, gravelly or peaty soil, and open sunny situations. Propagation is by seed sown in spring. The young plants must be frequently transplanted to encourage fibrous roots. The following are some of the most useful species. *P. Ayacahuite* very distinct, cones 18 in. long. *P. Banksiana* will grow in almost pure sand. *P. excelsa* is a very beautiful Pine with long leaves and big cones. *P. Lambertiana* is the noblest species growing up to 250 ft., and will grow in very exposed situations. *P. montana* is very hardy and will grow practically in any kind of soil, 60 ft. *P. m. pumilio* grows from 5–10 ft. only and is suitable for dry slopes, banks, etc. *P. muircata* prospers in almost any position, and in all soils. *P. rigida* will grow in quite moist soil. *P. sylvestris* is the “Scotch Pine,” *P. Thunbergii* is useful as a wind-break. This is one of the Pines used by the Japanese for dwarfing into quaint shapes. *P. virginiana* does well in heavy soils.

Pinusporum.—Evergreen shrubs with very attractive foliage and fragrant flowers, mostly for warm districts. *P. tenuifolium* is perhaps the most beautiful and hardy species, with pale shining green foliage, black stems, and very fragrant flowers. Makes a wonderful hedge. Thrives in ordinary garden loamy soil, and is increased by cuttings and seed.

Platanus.—The Plane is a handsome deciduous tree, with large maple-like leaves, and is much used for street planting. Plant in November in rich deep soil. Propagate by seed or cuttings about 10 in. long with a “heel” in autumn. *P. acerifolia* is the “London Plane,” and *P. orientalis* is the Oriental Plane.

Polygonum. See CLIMBERS.

Populus.—The Poplars are very fast growing deciduous trees and useful as wind-breaks. They like moist soil, and should be planted in November. *P. angustifolia* has narrow Willow-like, fragrant leaves. *B. candicans* is also very fragrant. *P. canescens* does well on chalk and its timber is valuable. *P. Eugenei* is the fastest growing Poplar. *P. lasiocarpa* bears very large leaves with a rich red mid-rib.

Potentilla.—Deciduous shrubs with dainty foliage, single rose-like flowers in summer and autumn. They thrive in ordinary garden soil, and are easily increased by cuttings. *P. fruticosa vilmoriniana* is one of the best with silvery foliage and creamy white flowers, and *P. f. Purdomii* is the finest yellow-flowered species.

Prunus.—A very extensive genus of evergreen and deciduous flowering trees and shrubs, including the Almond, Peach, Apricot, Plum, Cherry, etc. Plant in October or November in deeply worked, well-manured soil, with lime added, if lacking. They are increased by seed, budding and grafting.

ALMONDS, APRICOTS AND PEACHES

P. amygdalus is the popular and much admired single pink Almond. *P. Davidiana* bears white flowers in February and March. *P. persica flore roseus pleno*, the double-flowered Peach. *P. mume* is the Korean Apricot with very fragrant pink flowers. *P. cerasifera Pissardii*, purple-leaved Plum, with rose-coloured flowers. *Prunus avium* our native Cherry or "Wild Gean" bears white flowers; there is a double-flowered variety. *P. campanulata*, very bright red. *P. Sargentii*, one of the finest with large soft pink flowers and bronzy foliage. Of the Japanese Flowering Cherries, Kanzan with large deep pink flowers, and *James H. Veitch*, deep rose pink, are two of the best. *P. subhirtella autumnalis* is valuable for its almond-scented, pale pink flowers produced from November until March. *P. laurocerasus* is the "Cherry Laurel," or Common Laurel, and *P. lusitanica* is the well-known "Portugal Laurel."

Pyracantha.—The "Evergreen Thorns" are valuable for their beautiful orange or red berries, of which *P. coccinea Lalandei* is the best known and most popular. Of the easiest cultivation in almost any garden soil, and valuable for planting against house walls and garden fences.

Pyrus.—The Flowering Crabs are highly ornamental flowering shrubs and trees and thrive under the same conditions as *Prunus*. *P. Eleyi* is a beautiful hybrid with soft red flowers followed by large cherry-like fruits. *P. Malus "John Downie"* is one of the finest Crabs with large white flowers. *P. spectabilis*, pale rose, is also excellent.

Quercus.—The Oak is a large and important genus of evergreen and deciduous trees and shrubs, some of which produce valuable timber. They like a deep rich loam and leaf-mould. Plant in October. They are

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propagated by sowing the acorns as soon as ripe. The "Holm Oak," *Q. ilex* is the most important of the evergreen Oaks, and is a noble tree growing up to about 90 ft. It may be clipped into various shapes, and it makes a beautiful hedge. *Q. suber* is the "Cork Oak." Among the deciduous section *Q. ceris* the "Turkey Oak" is a very hardy and quick-growing tree of elegant habit. *Q. coccinea*, the "Scarlet Oak," is valuable for its brilliant red foliage in autumn. "Knap Hill Scarlet" is the finest form. *Q. pedunculata* is the "Common" or "English Oak" and one of our noblest trees, and was the sacred tree of the Druids.

Rhododendron.—This is such an extensive genus of evergreen flowering shrubs that only a few of the more popular and useful species and hybrids can be enumerated. Their cultivation presents no difficulties if they are planted in deeply-dug, well-drained, very sandy loam (they love sand), with leaf-mould or peat added. They do not thrive on calcareous ground, as chalk is death to the bacteria on whose health and well-being the *Rhododendron* depends. Firm and shallow planting are two important cultural points; and as they are surface rooting plants they should be top-dressed every year with leaf-mould and grit to the depth of about $\frac{1}{2}$ in. Ground draughts are very harmful. No seed pods should be allowed to form. They are increased by seed sown in very sandy peat or leaf-mould and by layering and by grafting. Of the many hundreds of species the following are very beautiful, and they will provide flowers from spring until August; *R. auriculatum*, very fragrant, white, August; *R. campylocarpum*, very beautiful yellow; *R. decorum*, white flushed pink, very fragrant; *R. Fortunei*, pinky lilac, fragrant; *R. Griersonianum*, a magnificent species with soft rose scarlet flowers; likes shade; *R. neriiflorum*, bright scarlet; *R. racemosum*, small flowers, bright pink; *R. Williamsianum*, shell pink; *R. yunnanense*, pale pink. The following are some of the finest hybrids: Nobleanum, scarlet, December to march; Praecox, rose lilac; Ascot Brilliant, deep crimson. Doncaster, scarlet crimson; Lady Eleanor Cathcart, clear pink; Alice, deep pink; Loder's White; Dr. Stocker, ivory white; Goldsworth yellow; Peter Koster, crimson, pink edges; Kate Waterer, rosy crimson, yellow centre; Joseph Whitworth, deep purple lake.

Among the Azalea section the following are evergreens: *R. balmi-neoflora* is a dwarf, spreading bush with exquisite double salmon-red coloured flowers which persist on the plant for about a month; *R. ledifolia*, fragrant, white; *R. Maxwellii*, carmine; *R. obtusa*, very dwarf, various colours. The following are deciduous: *R. arborescens*, flesh colour, very fragrant, July; *R. calendulacea*, flame colour; *R. pontica*, the Common Yellow Azalea, valuable for its brilliant autumn foliage and very fragrant flowers. There are numerous hybrid Azaleas of garden origin and the following list includes some of the most notable:

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J. C. Van Tol Imperial, the finest red; Mrs. L. J. Endtz, yellow; Ruby, crimson; Robespierri, deep pink; M. Koster, carmine; A Lavellee, orange red; Albicans, white; Anthony Koster, bright yellow; Emil Liebig, salmon; Hugo Koster, salmon red; Koster's Brilliant, glowing orange.

Ribes.—Evergreen and deciduous flowering shrubs. They grow in ordinary soil, and are increased by cuttings. The one most generally

FLOWERING SHRUBS.



The taller flowering shrubs can be used as a permanent background to the herbaceous border

grown is *R. sanguineum* the well-known flowering currant with rosy-red flowers. *R. s. splendens* is the finest form.

Robinia.—Deciduous trees and shrubs bearing pea-shaped flowers and elegant fern-like foliage. They like a sheltered position in well-drained loamy soil. *R. hispida*, the "Rose Acacia," is the finest species and one of the most beautiful of flowering trees.

Rosmarinus.—The Rosemary is an aromatic evergreen shrub not needing any description. It likes well-drained soil and sunny positions. Easily increased by cuttings and layers. It bears clipping well, and makes a nice hedge. *R. officinalis* is the only species. There is a trailing prostrate form useful for the rock garden and an erect, pyramidal form which is the one for hedges.

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Rubus.—Brambles are not much grown in the flower garden, but *R. deliciosus*, the finest species, bears very attractive pure white flowers, like single roses, about 2 in. across, and *R. biflorus* is effective in winter with its dazzling white stems.

Salix.—The Willows are hardy deciduous and evergreen shrubs, very useful for moist situations. They are increased by cuttings taken at any time, and inserted in damp soil, and by seed. *S. babylonica* is best by the waterside. *S. caprea* provides "palm" for Palm Sunday. Does well on chalk. *S. cœrulea* the "Cricket Bat Willow." The finest cricket bats are made from its wood, and the lower grade bats from *S. fragilis*. *S. lanata* has silvery leaves and golden catkins. *S. magnifica* bears catkins 12 in. long. *S. purpurea* is remarkable for its very tough and supple twigs which are in demand for fine basket-work. *S. repens nitida* is a dwarf species of 18 in. *S. vitellina* has golden yellow branches much used for basket-making.

Skimmia japonica.—An attractive evergreen shrub, 3–4 ft. high with glossy laurel-like leaves and red berries. Both sexes must be grown together to ensure a plentiful crop of berries. They like a moist loam and semi-shade and are increased by seed and cuttings.

Spiræa.—Beautiful flowering shrubs, mostly deciduous, of easy cultivation in most loamy soil in full sun. They are increased by cuttings taken in September and placed under a bell-glass. Correct pruning is essential. Those which flower on the current year's wood must be pruned in winter or early spring. Old shoots should be removed entirely and the younger ones cut back to within 1 ft. or so of the ground, and thinned out to about 6 in. or 8 in. apart. Those which flower on the wood of the previous year, should have the wood removed *immediately after flowering*. The following is a good selection of the most useful species: *S. arguta*, small white flowers in April and May; the best white 3–5 ft. *S. discolor* bears drooping plumes of creamy-white flowers in June and July; beautiful autumn foliage 6–12 ft. *S. Menziesii*, purple-rose, from June to September. *S. prunifolia flore pleno* one of the finest species. Small double white flowers during April and May; superb autumn foliage, 4–6 ft. *S. tomentosa* rosy-purple flowers and dark red foliage in autumn. *S. Van Houttei* white flowers in June. *S. Veitchii* bears shoots 8 ft. long covered with pure white flowers.

Syringa.—The "Mock Orange" lilacs are well-known beautiful deciduous flowering shrubs and trees which like rich loamy soil and sunny positions. They all do well on chalk. The flower trusses should be removed *immediately after flowering*. Cut out all weak growths. Propagation should be by layering and cuttings and never by grafting. The "Common Lilac" *S. vulgaris* is the most useful for gardens generally, and some of the best-named varieties are: Belle de Nancy, double, satiny

pink; Madame Lemoine, double white; Charles Joly, double dark red; Congo, single, red purple; Marie Legray, single white; Souvenir de L. Spath, single, deep wine purple.

(Philadelphus the "Mock Orange" is often commonly called Syringa in error.)

Tamarix.—Deciduous trees or shrubs with feathery foliage and plumes of pink flowers during summer and autumn. Easily grown in light sandy soil. Propagation by cuttings 8 in. long. *T. pentandra* is the principal species. It should be cut back to the old wood in winter.

Taxus (Yew).—Very hardy evergreen trees and shrubs, which thrive in almost any soil, and especially one of a calcareous nature. The Yew makes beautiful hedges and is much used for topiary work. Propagation is best from seed. *T. baccata* is the "Common Yew" and there are a number of varieties differing in the size and colours of the leaves.

Thuja (Arbor vitæ).—Handsome evergreen trees of pyramidal outline, often used for making hedges in place of Yew and Cupressus macrocarpa. Plant in May or September in moist garden soil in sunny position. Propagation is by seed sown in a frame. *T. dolabrata*, *T. japonica*, *T. occidentalis*, and *T. plicata* are the most generally useful. The latter species makes a beautiful hedge and bears clipping well, which is rather remarkable for a tree which grows up to 200 ft. high in nature.

Tsuga.—The "Hemlock Firs" are beautiful evergreen trees of very elegant form. They need a well-drained deep loam in a district where there is abundant rainfall. They are increased by seed. One of the most beautiful is *T. Albertiana* with glossy dark green foliage and reddish brown bark. *T. canadensis* is very hardy and will grow in calcareous soil. *T. c. pendula*, a beautiful weeping form. *T. diversifolia* makes a nice specimen shrub for a lawn. *T. Sieboldii* a graceful slow growing species is also suitable as a lawn tree.

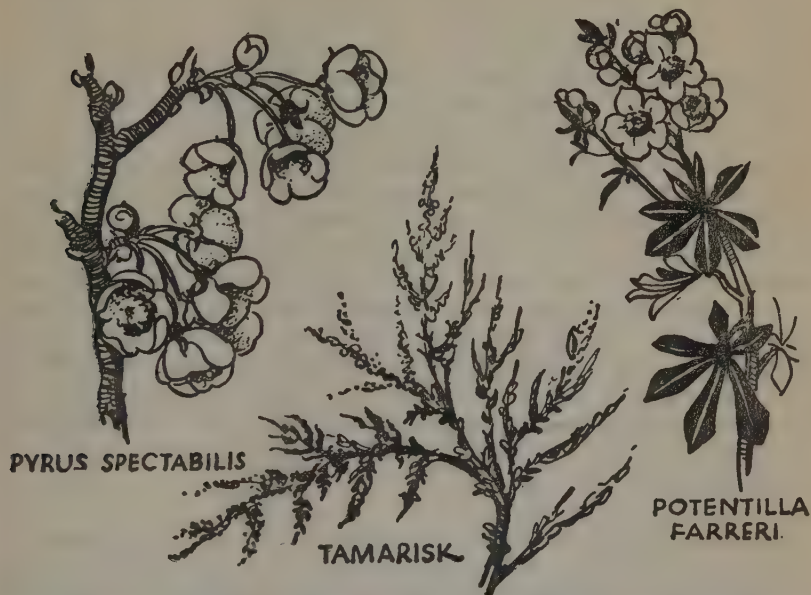
Ulex ("Furze," "Gorse" or "Whin") is found growing in poor dry soil in heather districts or downland, which indicates its cultural requirement. Seed is the best means of increase for *U. europæus* the single flowered form, while the double flowered form *U. e. flore pleno* has to be increased by cuttings of the current season's wood, about 3 in. long in August, as it never produces seed.

Ulmus.—The Elm is a noble tree which thrives in most soils and in quite exposed positions. Increased by seed and root suckers. The best known is *U. campestris* the "English Elm." *U. Hillieri* is a graceful weeping Elm. *U. montana* is the "Wych" or "Scotch Elm." *U. pumila* is a small growing species 10–30 ft. high and the most suitable for small gardens.

Vaccinium.—Hardy evergreen and deciduous shrubs noted for the beautiful autumn foliage and berries of various colours. They need a

TREES AND SHRUBS

damp peaty soil, in sun or shade. Propagation is by seed and cuttings. Of the many species *V. corymbosum* is perhaps the finest. It is deciduous, grows from 4-10 ft. high, bears white lily-of-the-valley-like flowers in May. The leaves turn to a vivid red in autumn; berries blue-black. *V. parvifolium* has pinkish flowers and bright red berries and rich autumn



Colourful flowering shrubs such as these should be included in your garden planting scheme. *Pyrus* is a small flowering tree; *Tamarisk*, a useful seaside shrub, and *Potentilla* give colour to the shrub border

foliage. *V. Myrtillus* is the well-known native Bilberry with pink flowers and bluish-black edible fruit.

Veronica.—A very large genus of evergreen flowering shrubs, which bear spikes of flowers of various colours over a long period. Plant in April or September in well-drained garden soil. Propagation is by cuttings taken in August. The young plants should be pinched occasionally to make them bushy. Among the most popular species and varieties are: *V. Andersonii*, 2-4 ft., purple flowers from July to September; *V. buxifolia*, a semi-prostrate species, 2 ft., whose chief value is its decorative foliage; flowers white; *V. elliptica*, fragrant white flowers; *V. Hulkeana*, a beautiful tender species for a wall with flower spikes 18 in. long of lavender blue flowers. 3-4 ft. in May and June. *V. salicifolia*, 5 ft. long spikes of white flowers; *V. speciosa*, 5 ft. reddish purple. Many

fine hybrids have been raised from this species and the following are among the best varieties: *V. s. Alicia Amherst* (*Veitchii*), deep purple; *V. s. Diamant*, crimson; *V. s. La Marveilleuse*, soft rose; *V. s. Mont Blanc*, white. *V. Traversii*, 4-5 ft. is a very hardy species with white flowers, and thrives in town gardens.

Viburnum.—Deciduous and evergreen shrubs and trees, bearing white flowers mostly, succeeded by handsome fruits and very attractive autumn foliage. They thrive in ordinary garden soil, moist for preference, in sun or partial shade. Propagation is by cuttings about 3 in. long in July, and by layering in October, and seed sown as soon as ripe. The following include the best and most useful species: *V. betulifolium*, a beautiful shrub with bright red fruits. *V. Carlesii* bears very fragrant white flowers in May. *V. Davidii*, deep blue fruits. *V. fragrans* bears very fragrant pink flowers during autumn. *V. Henryi* is very ornamental with bright red fruits. *V. Lantana*, the Wayfaring Tree, has red fruits and dark crimson leaves. *V. Lentago* has beautiful autumn foliage. *V. Macrocephalum* bears balls of white flowers in May and is best against a wall. *V. opulus* is the well known Guelder Rose, and bears bright red fruits and crimson tinted foliage. *V. tinus* (*Laurustinus*) bears clusters of rosy white flowers from November to April. *V. tomentosum Mariesii* is one of the best Viburnums and bears white flowers in May and June. *V. t. plicatum* is also very fine with balls of ivory-white flowers in May and June.

Vitis. See CLIMBERS.

Walnut. See JUGLANS.

Yucca.—Evergreen shrubs of stately habit, with large rush-like leaves and erect spikes of beautiful lily-like flowers. They are useful for imparting a sub-tropical effect, and are good town plants. They need a hot, sunny position, and are not particular as to soil, but deserve a good loam. Propagation is by removing the underground stems and potting them up in sandy soil. The tops of the plants will root if half the leaves are removed and the stem placed in a pot of sandy soil, and kept in a greenhouse until rooted. The most beautiful species is *Y. Whipplei*, with its 12-ft. inflorescence of greenish white flowers, and narrow leaves about 18 in. long. Not so hardy as the others, and needs a very hot position, and should be planted on sloping ground if possible. *Y. filamentosa* is a beautiful Yucca with leaves up to 2 ft. long and yellowish-white flowers. Makes a very effective group. *Y. recurvifolia* has glaucous leaves and creamy white flowers and is very free flowering. *Y. gloriosa* is the well known "Adam's Needle" and bears creamy-white flowers, with a tinge of purple, and blooms from July to September.

Zenobia.—Sub-evergreen shrubs with exquisite bell-shaped pure white flowers in June and July. They prefer a peaty soil, but will thrive in sandy loam and leaf-mould, in semi-shade. Propagation is by seed, also by

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cuttings of half-ripened shoots taken about July and placed in gentle bottom heat. The plants should be pruned over after flowering. *Z. speciosa* is the only species, and the form *pulverulenta* is even more beautiful, with glaucous foliage and larger flowers. It is perfectly hardy, and should be in every garden where the soil is lime-free.

CLIMBING PLANTS

Plants and Shrubs which possess a climbing nature include a wide range of beauty and usefulness. Apart from their value in embellishing the walls of our dwelling-houses, they are indispensable for covering garden walls, and fences, tree-stumps, arches, pergolas, summer- and garden-houses, &c. The preparation of the ground intended for climbers should receive as much careful preparation as for other shrubs and plants.

The self-clinging climbers are provided by Nature with the means of supporting themselves, but those which do not possess this habit should be carefully trained and fastened to their supports as occasion arises. The necessary pruning is indicated in each genus.

Actinidia.—See p. 245 for a description of these shrubs. Pruning consists in thinning out and regulating the branches in February and again in summer if necessary.

Celastrus.—Vigorous climbing plants with inconspicuous flowers, and very attractive fruits in autumn. Useful for climbing up old trees, trellis, &c. 10–15 ft. They like a rich soil, and are propagated by layers and seeds. The species most generally grown is *C. articulatus* which has golden-yellow foliage in the autumn and bright red fruits which remain decorative for many weeks.

Clematis.—No climbing plants are more beautiful and useful, if we except roses, than the various species of Clematis and their hybrids which are so deservedly popular with the gardening public. Belonging to the “Buttercup” family they appreciate a well-drained, cool, moist soil. The only pruning necessary for the species is to remove all dead and useless wood in early spring. The principal species are:—*C. alpina*, a low rambling Clematis suitable for growing among bushes and in the rock garden. Flowers light purple. *C. Armandii*, an evergreen species bearing fragrant creamy-white flowers. Needs wall protection. *C. indivisa*, a very beautiful, but tender species with white flowers about 3 in. across. *C. macropetala*, an exceptionally fine species bearing very beautiful and refined sapphire-blue flowers. Excellent for trailing over shrubs, &c. *C. montana* is a very free white-flowering Clematis in May. *C. m. Wilsonii* has larger flowers and blooms in July and August. *C. recta* forms a bush 3 ft. high and bears masses of creamy flowers. Likes a limy soil. *C. tangutica* is a yellow-flowered species. *C. vitalba* is the well-known “Traveller’s Joy” or “Old Man’s Beard.”

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LARGE-FLOWERED HYBRID CLEMATIS

Patens Section

These bear large flowers in May and June. Remove all dead wood and crowded branches immediately after flowering. *Lady Londesborough*, silver-grey. *Miss Bateman*, white, and *Lasuristern*, deep blue, are recommended.

Jackmanii Section

The flowers of this section are produced from July to October. Cut back the old stems in February to about 12 in. Among the finest varieties are: *The President*, dark plum-purple; *Perle d'azure*, bright blue; *Gipsy Queen*, velvety purple; *Jackmanii*, violet and its white-flowered form, *Comtesse de Benchard*, soft carmine rose.

Lanuginosa Section

These flower from June to October. Prune lightly in February. There are many varieties to choose from and some of the most beautiful are: *Beauty of Worcester*, blue; *Crimson King*, rich crimson; *Grand Duchess*, blush white; *Lady Caroline Neville*, French white, with pink bar; *Grace Darling*, rosy carmine.

Florida Section

The large double flowers are produced in June and July. Prune as for *Patens* section. The best varieties are: *Lucie Lemoine*, white; *Belle of Woking*, mauve; and *Duchess of Edinburgh*, white.

Viticella Section

These bloom in large masses from July to October. The most beautiful is *Lady Betty Balfour*, deep velvety purple. The following are also recommended: *Ascotiensis*, azure; *Ville de Lyon*, crimson.

Hedera.—The common Ivy is too well known to require any description. There are, however, certain species and varieties which are not so familiar to many gardeners. The spring is the best time for planting. Pot plants can, however, be set out at any time. The variegated forms are most satisfactory in poor soil. Cuttings root readily in late summer inserted in a shady border. Cut back weak shoots to ground level. *Hedera Helix* is the "Common Ivy," and the following are good varieties: *H. H. conglomerata*, dwarf, suitable for rock gardens; *H. H. elegantissima* is a charming variety with leaves of green, margined white, tinted pink; *H. H. purpurea*, bronzy purple leaves in winter; *H. hibernica* is the "Irish Ivy," has larger and paler coloured leaves; *H. canariensis*, the "Canary Island Ivy" with large leaves; *H. c. variegata*, leaves bordered white; *H. Chrysocarpa*, the "Italian Ivy," has yellow berries; *H. Colchica*, the "Persian Ivy," has leaves 10 in. long and 7 in. across.

Jasminum.—Deciduous and evergreen climbers and shrubs with white, pink or yellow flowers in summer and winter. Plant in good loamy soil any time from October to March. Propagation is by cuttings of

TREES AND SHRUBS

ripe wood in a frame and by layering. *J. nudiflorum* is the "Winter-flowering Jessamine" with yellow flowers; and *J. officinale* is the "Common White Jessamine." *J. primulinum* is a very beautiful species from China bearing large soft yellow flowers from May onwards. Needs a south wall.

Juglans.—Deciduous trees with handsome foliage, and of rapid growth. Valuable for the edible nuts and for its timber. Plant in October in well-drained loam in an open position. Propagation is by sowing the nuts as soon as ripe, 4 in. deep in the open. *J. regia* is the Common Walnut and is a very valuable timber tree. *J. r. maxima* bears very large nuts. *J. Sieboldiana* is a Japanese species with very large leaves up to 2 ft. long.

Lonicera.—The climbing "Honeysuckles" are valuable for their delightfully fragrant flowers, and for rambling over fences, tree-stumps, summer-houses, &c. They thrive in any good garden soil. The following are useful species: *L. Henryi*, purple-red flowers followed by blue-black berries; evergreen. *H. Hildebrandiana* is a semi-evergreen species, with yellow flowers, about 4 in. long in large clusters. Very tender. *L. etrusca* is a beautiful climber, large clusters of fragrant flowers which open white and turn to yellow. *L. Giralddii* bears small purplish-red flowers. *L. Periclymenum* is the well-known native "Woodbine." *L. tragophylla* is a very ornamental Chinese honeysuckle with large golden-yellow flowers.

Passiflora cærulea is the "Blue Passion Flower," which bears large fragrant blue flowers from June to September. Suitable for a sunny wall.

Polygonum baldschuanicum is a rampant climber with white flowers, flushed with pink, borne in large panicles throughout the summer and autumn. Of the greatest value for covering old sheds, outhouses, fences and for climbing into trees, &c. Easily grown in any garden soil and in almost any position. Propagated by cuttings taken in July or August, about 3 in. long with a heel, and placed in sandy soil in a frame.

Solanum.—Rapid growing, semi-evergreen flowering climbers which thrive in ordinary garden soil. Plant in early May. Cut out weak shoots in February. Propagation is by cuttings of young wood about 3 in. long under a bell glass, and by layering in autumn. *S. jasminoides* grows about 12 ft. high and bears clusters of white flowers from June to October. Likes a warm position in gritty soil with leaf-mould added. *S. crispum* grows up to 18 ft. and is covered with bluish-purple flowers from June to August. Except in warm seaside districts it needs wall protection.

Vitis.—The ornamental vines, with their very varied foliage are of the greatest value in gardens, for covering tree-stumps, pergolas, out-

houses, &c., &c. They are all of the easiest cultivation in good loamy soil. Propagation is by layering and seed. The true vines can be increased by "eyes" placed in pots of sandy soil. Cuttings of the *Ampelopsis* group root readily. The chief species are: *V. coignetiae*, a Japanese vine of great vigour and one of the finest species with superb autumn foliage. The leaves are about 1 ft. across and turn to brilliant scarlet in the autumn. It is almost unsurpassed for climbing up a tall tree. *V. Davidii* is a fine species with glossy green leaves which assume brilliant autumn tints. *V. Henryana* is a self-clinging vine with beautiful velvety green leaves which become beautifully coloured in autumn. Very fine for a north, west, or east wall. *V. heterophylla* is a free-growing vine with variable leaves and conspicuous turquoise-blue berries. Suitable for a south wall. *V. inconstans* is the well-known *Ampelopsis* Veitchii of gardens. It is a self-clinging species and will reach a height of 60 ft. Leaves turn vivid red in autumn. *V. quinquefolia* is the true "Virginian Creeper" of North America. Foliage superbly coloured in autumn. *V. Thomsonii* is a fascinating species with the young shoots, leaf-stalk and foliage of a claret-purple colour, which gradually change to green and purple, and finally become dark crimson. *V. vinifera* is the ordinary or crimson grape vine. The variety *Brandt* has beautiful autumn foliage of crimson gold and pink, and *V. v. purpurea*, the "Claret Vine" is notable for its translucent claret-coloured young leaves which change to deep vinous purple.

CHAPTER VIII

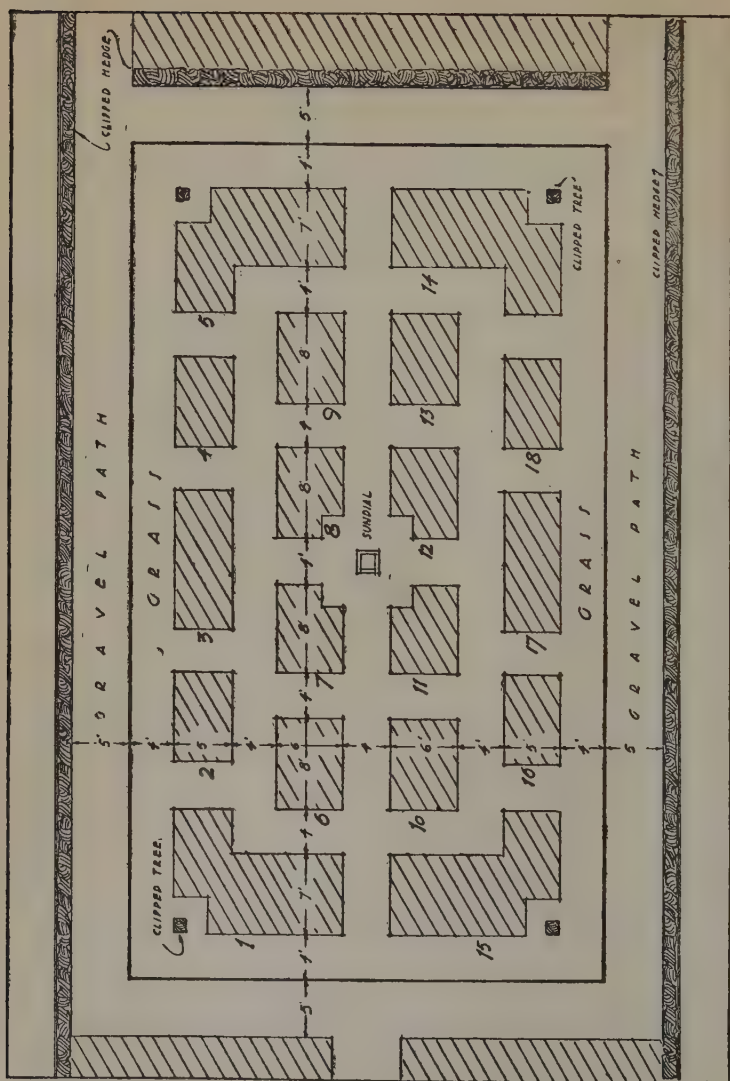
ROSES AND ROSE GARDENS—ROSES IN GARDEN DESIGN. CULTIVATION—LIST OF POPULAR KINDS FOR VARIOUS PURPOSES

ROSES IN GARDEN DESIGN

LOVE of the beautiful must take a large share in the character of the average Englishman. It may not be uppermost or so marked as with some of the more southern races of the continent, but it is there. Why, otherwise, was the first wise choice made of the rose for our national emblem, when Scotland must have the thistle and Wales nothing more beautiful than a leek? And as it is England's flower, so we expect and do find it in almost every portion of ground called, pretentiously or otherwise, a "garden."

Every gardener grows roses. They are amenable to most sorts of human treatment, and probably that is why most people think they need no very especial care in cultivation. For this reason there are roses and roses, and also good and bad methods of growing and showing them. A flower that speaks so eloquently for itself as the rose, demands the best that is in us in the way of cultivation and care in growing. Only by giving it this special attention can we expect to have specially beautiful blooms. Many may be content to plant their trees in the handiest border or bed and leave them to flower as prolifically as they can in the circumstances, but there are many, too, who will be prepared to go to some trouble for the sake of the greater pleasure obtained.

This century is essentially one of progress. The garden has had its share of novelty, with everything else, and consequently the material for our use abounds in variety, far more than was the case fifty years ago. Greater privilege brings greater responsibility. The larger number of types, colours, etc., demand greater degree of care and expert knowledge in their proper distribution in the garden. Only long study of all the problems experienced by the veteran gardener can produce the co-ordinated knowledge desirable. The amateur gardener, in the large majority of cases at any rate, has little time to spare for the planting of his garden. In fact, most of our suburban gardens are only touched at week-ends and in the evenings when light and weather permit.



The proportion of the flower beds to the width of grass and pathways makes or mars a formal garden design. This plan is suitable for a rose garden or beds of bulbs and annuals

ROSES IN GARDEN DESIGN

Necessity of Planning.—We have said that some gardeners plant their rose trees in the first patch of soil that comes to mind, without any prior consideration of all that this entails. A garden is more than a vase, and to plant a rose regardless of its surroundings may mean, in measure "To waste its sweetness on the desert air." Because of this the gardener speaks of his rose garden—an entity set in and yet in harmony with the whole of his grounds, whether large or small. In the proper formation of a rose garden, with its different types of roses and its design to suit the surroundings, that expert skill is displayed.

It may be thought that to make a rose garden it is only necessary to cut out a few more or less fancy shapes in the centre or at the side of a lawn, dig over the ground and plant the trees. The shapes generally followed are circles, crescents and triangles with concave sides. They are sometimes cut out with no sense of cohesion, either with one another, or with the rest of the garden. They hold roses and show colour, but that is all that can be said in their favour. The garden lover who plans a rose garden should aim at something more than this. If possible, a space of ground should be set aside, preferably not too far from the house, and a plan drawn out to scale so that the whole scheme may be entirely grasped mentally before the soil is touched. By this means a lot of possible trouble is saved at the outset.

In planning, many problems will present themselves to the thoughtful gardener, that may not at first be suspected. According to the size of the garden different styles of design must be adopted. It is good to see fair-sized beds, set to give a sense of broad space, if surrounding open country suggests this arrangement. If the space be confined, or surrounded by walls or hedges, the beds must be decreased in size accordingly: and possibly this may allow for more scope in the way of ornamental shaping.

Focal Points.—The beauties of a garden are conveyed to the mind through pictures photographed on the lens of the eye. This may seem an obvious remark, but there is reason for it. A garden should reveal living pictures at every turn, and to arrive at this result it is necessary to do more even than plant our roses or trees in some sort of formation. It is a prime rule with the artist or photographer that his picture must be *composed* round some feature. This may not be apparent at first glance, and very often it does not seem to the layman to be an essential of the picture, yet it is in reality the key-piece of the whole composition. Take it away, and the careful observer will know something to be lacking. The reason for this is that the eye is focused on a certain point even though it photographs a whole scene, and to get the best possible mental picture, the picture must be created round this point, and it must be taken into consideration when planning. In short, let there be some

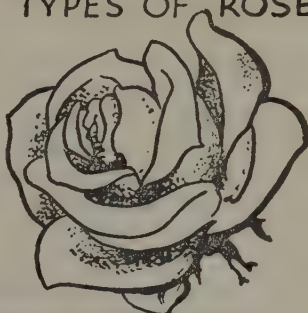
COMPLETE GUIDE TO HOME GARDENS

feature of certain interest set as a focal point in your garden. The beds of roses may centre round it if your design allow, or they may be away from it, but that some sense of connection be given is necessary for the composition of the picture. The feature may take various forms. In a big garden nothing looks finer and more restful to the senses than

TYPES OF ROSES.



MOSS ROSE



HYBRID PERPETUAL



POLYANTHA



RAMBLER



HYBRID TEA



SINGLE

The various types of roses can be used for different purposes. Choose fragrant varieties whenever possible

a flat pool surrounded by beds. Water always gives a sense of repose and is ever beautiful. Small gardens may not allow of a pool, but the central motif may then be a sundial or old lead figure of a size and style in conformity with the garden.

The beds themselves must be shaped to some definite design, not too intricate, but certainly they must give a sense of a "rose garden" and not mere "rose beds." They must be properly proportioned with the intermediate spaces, and should be so formed that the eye-view may travel without disturbance from required points on to the central feature.

Harmony of Colour.—The colours of the beds are an important item. They must contrast distinctly one with the other. They must

ROSES IN GARDEN DESIGN

be so arranged as to help the eye to travel on to the main feature and not to arrest its view by disturbing our colour sense. A suggestion for such an arrangement is given in an accompanying sketch-plan.

Dark colours such as *Etoile de Hollande*, *Hadley* and *Miss C. B. van Rossum* are planted in the outside beds, and the colours lighten towards the centre. Rich yellows as *Christine* and *Golden Emblem*, with orange tints as *Betty Upchurch* and *Shot Silk* lead up to lighter yellows and shades of pink. The central feature of this garden is a sundial or piece of statuary.

Pathways and Edgings.—A rose garden has to bear inspection from close at hand as well as from a distance. There must, therefore, be some good pathways between the beds, apart from the necessity of separation. It is good to have a dry path if possible, for English summers have their rainfalls, and it is not pleasant to gather or inspect roses while one's feet are squelching in wet grass. Roses look well when set in a green frame, and certainly for a large garden with broad spaces between the beds, turf is the best setting. The man who cuts the grass is the only one to grumble, for with strong-growing roses some shoots are bound to overhang the soil edge. It is not a bad plan to border the beds with a flat-stone edging or, alternatively, the roses could be set back a little and a narrow edging of smaller plants be introduced. *Violas* are good for this position, both by reason of their size and their continuous flowering qualities. Box-edging was a great favourite years ago but really it is not the best thing to use. It usually harbours insects, and certainly needs a great deal of attention to keep in good condition. It looks well between roses and a gravel path and is often used in such a position, but there are other more suitable plants that are less trouble to maintain.

In a smaller garden it is possible to dispense with turf entirely if required, and form the pathways between beds with paving-stone. This could be laid either in crazy style or in random squares. Nothing looks finer than York stone when it has been laid a short time and allowed to weather. A charming effect can be obtained by leaving the cracks between the stones open and planting here and there small Alpine plants such as *arenaria*, *thymus* and *sedums*. A variation from stone paving is obtained by laying old red bricks on edge to squared or herring-bone pattern. Or again, the paving and bricks may be laid together in some suitable design. All these styles are easily formed and give an exceedingly good base for the roses.

Boundaries of Garden.—The rose garden as an entity may be itself framed in some way if so desired. The beds may, of course, be cut in a stretch of turf and have no other boundary than the outside edges of the beds, or perhaps merely a low hedge of lavender or sweetbriar be planted round. Some positions may demand more enclosure, especially

if it is desired to use the garden as a retreat. Then yew hedges may be used or perhaps a series of parts planted round, with chains suspended between, over all of which wichuaiana roses would ramble in a riot of colour. Such a surround to the garden would give a good lead-off to a pergola treatment along a selected path leading to some other part of the grounds. Posts and chains could be used for this and would look really well if planted with wichuaiana roses and clematis with wistaria at intervals if desired. The pergola itself may have overhead timbers, too, and certainly few things are more pleasing than a view along an old York-stone path, its sunlit surface broken at irregular intervals with the shade of clustering branches of the roses overhead.

Use of Standards.—Standard roses, weeping or ordinary types, may be used to advantage in some cases. Discretion must be observed, though, in the selection of a suitable position. A good effect may be obtained by planting weeping roses alternately with dark green Cypresses along the sides of a long gravel or paved walk. They must be in a position that by reason of its proportion and dignity can set them off to full advantage.

THE CULTURE OF ROSES

The proper growing of roses involves more than good design for the beds. The prime consideration, after all, is colour, and as much bloom as possible. This demands that they be planted in the right kind of soil and in a position best suited to their requirements.

Soil.—The soil should be a fairly stiff loam, of a good depth. Light sandy soils are of very little use. The only way to grow roses on such is to take out the top soil to a depth of about 18 in. and fill up with a good rich loam. A liberal supply of manure should be incorporated with it.

The soil should be well drained, and for this reason, a substratum of chalk, gravel or other porous material is to be desired. Gravel may cause the beds to become too dry, but with a little care and forethought this can be avoided. Chalk should not be too near the surface if roses are to grow above, but when there is a good depth of soil, quite good results can be obtained. There should be at least 18 in. of good loam above such a substrata.

Position.—Roses revel in sun and fresh air. For this reason care must be taken in choosing the place in which to plant them. They do not like shade, but at the same time they must not be in an exposed position for they dislike cold winds and frosts. It is a good plan to plant roses, if other considerations allow, on high ground, for frost is generally more harmful in valleys.

Planting.—The best time to plant is early November, though,

ROSES IN GARDEN DESIGN

providing no severe frosts prevail, planting may be carried on throughout the winter if necessary. It is wise, however, to get the trees in early or failing November to leave them over until February or March.

The preparation of the beds should be done well before the roses are planted so that the soil may settle down. The trees must be planted firmly and this cannot be done when the soil is loose and springy.

The holes should be dug large enough to receive the fibrous roots without restriction and the tree planted sufficiently deep to allow of about 1 in. of soil above the point of grafting when planted. In the case of standard roses, a hole about 6 in. deep should be sufficient to secure firm planting.

The soil placed immediately next to the roots should be fine and friable, and it is necessary that it goes well amongst and around the fibres. Over this light covering a layer of soil, say 3 in. deep, should be filled in and this trodden down firm. The hole should then be filled up and made firm. When planting standard roses a good stake should be driven into position before the tree is planted. When the hole is filled up, the tree should be bound to the stake, taking care that a twist of binding material passes between the tree and the stake to prevent chafing of the bark.

Pruning.—Rose trees planted in the autumn should not be pruned until the spring, but roses planted in the spring should be pruned immediately. Only when there are exceptionally long shoots on trees planted in autumn, should they be cut off at the time of planting, and this is to prevent wind loosening the tree in the soil.

Pruning as done by the amateur gardener is generally too light rather than too heavy, and often insufficient wood is cut away. Standard trees should have their shoots cut back to about 4 in. from the stock, but bush roses may be allowed 6 in. of shoot above ground. This applies only for the first time of pruning subsequent to planting.

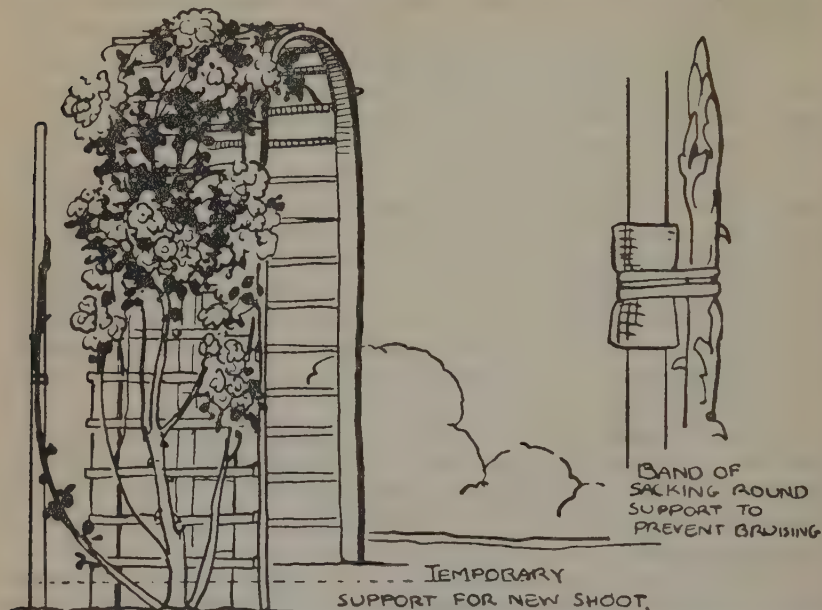
Treatment after this varies according to the variety. Hybrid Teas are more generally grown than any other types and these, with Hybrid Perpetuals and Standards should be pruned in March.

Bush and Standard Teas should be pruned in April, Wichuaiana Ramblers (the climbers that send up long shoots from the base) are pruned immediately after flowering. Other climbers are pruned in March. Plants grown for exhibition purposes require more severe pruning than those grown for ordinary bed decoration. Generally speaking, weak-growing varieties should be pruned more severely than the stronger-growing sorts. Those requiring hard pruning include: Hybrid Perpetuals, Hybrid Teas and Teas. In their case the centre of the plant should be well trimmed and all dead or weak shoots cut away. All other shoots should be cut back to about four to six buds. Examples

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of this type are Mrs. Henry Morse, Earl Beatty, Admiration and Rev. Page Roberts.

Moderate pruning is demanded by some trees of the same classes as above. All dead and weak shoots should be taken away, also any shoots which may cross one another when full grown. The strong shoots



The strong summer growths of climbing roses can be tied to temporary supports until the plant is ready for autumn pruning

left should be cut back to about six to eight buds. Types requiring this sort of pruning are Betty Upchurch, Clarice Goodacre, Emma Wright, General McArthur, Etoile de Hollande, Los Angeles, Mabel Morse, Shot Silk, etc.

Other varieties require only light pruning. With these, the strong shoots from the ground should be cut back to about 8 in., while other shoots should be cut so as to leave about one to three buds on the side shoots. The side shoots on the old wood should be cut back to four or five eyes. It is wise to peg down the strongest-growing varieties, some of the shoots being 3-6 ft. long. Such roses as require this pruning are Frau Karl Druschki, Hugh Dickson, Caroline Testout, etc.

Climbing roses (not ramblers) require least pruning of any sorts. It is advisable each year to take out all wood over two years old and also any weak or dead shoots. This should be done in the early autumn,

ROSES IN GARDEN DESIGN

immediately after the flowering period. All young shoots should be tied into position at the same time. When the lower parts of the plant become bare of shoots it is a good plan to bend a runner back to fill the gap, or to cut one or two shoots back so as to induce low growth. Roses that require this sort of pruning are Climbing Caroline Testout, Mme. Ed. Herriot, Climbing Lady Hillingdon, Wm. Allen Richardson, etc.

Pruning of Ramblers.—There is another class of rose used for covering arches, pergolas and porches, that is the *Rambler* rose group. The pruning of these is quite different from the pruning of the *Climber*. The climber is merely a taller version of the ordinary bush rose, and is pruned on the same principles as the bush rose, except that a larger skeleton of old wood is retained so that the rose covers more space on the support.

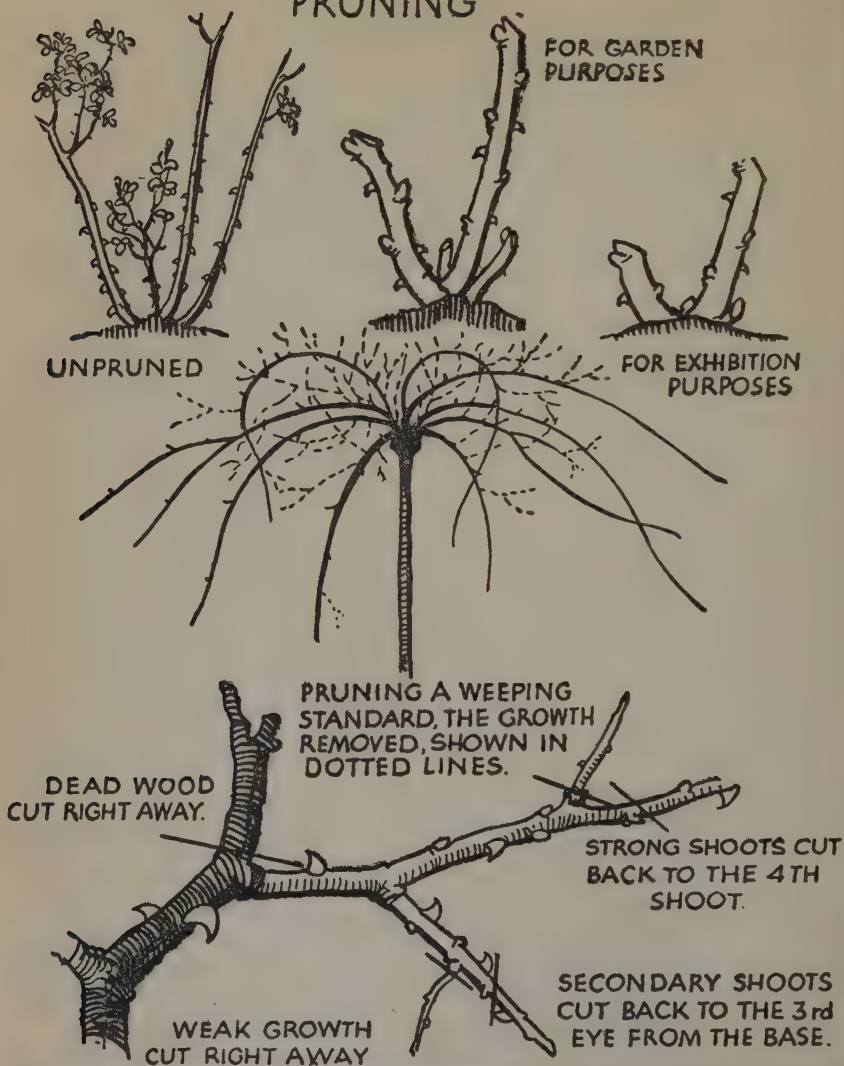
The true rambler rose has a very different habit of growth. It usually grows long new stems right from the ground level every year, very much in the same way as a raspberry or a blackberry. If allowed to grow unchecked, the old wood will certainly send out young shoots, that will in turn carry flowers, but these flowers will be of inferior quality as the seasons pass, and the plants will gradually become crowded and unhealthy.

What the gardener does is to take out entirely the old shoots that have borne flowers, cutting them right down to ground level. He then trains the new long canes that have not yet flowered into position over the pillar or archway which forms the support. This pruning is done in late summer as soon as the flowers have faded. There are some cases in which pruning cannot be carried out in quite such a drastic manner as described. For instance, some roses do not make long shoots freely from the ground level, but send out new strong young stems from some part of the old woody stem. In these cases it is obviously impossible to cut out entirely the wood that has carried flowers, but as far as possible the principle should be adhered to, and old wood cut away each year immediately the flowers fade.

Alberic Barbier is a well-known example of a rose that does not grow freely from the base. It does, however, send out innumerable strong stems from every part of the old wood, and drastic thinning out of the oldest parts is necessary from time to time. This type of rose makes a useful "smother" rose to cover a porch, fence, or wall, and when it can be allowed to roam freely, very little pruning need be done.

A Tip to Growers.—One thing which is very important in the case of the rambler roses is to avoid breaking the young new stems either before or during pruning. A good tip is to tie the stems to a separate cane a foot away from the archway or pillar during the early part of the summer, retying them from time to time as they grow. This greatly

PRUNING



Weak growing roses are cut hard back in March or April. Strong varieties need not be pruned so drastically

ROSES IN GARDEN DESIGN

simplifies the task of pruning, since the young and old wood are already separated, and all that has to be done is to cut the older stems away from the supports and tie in the new canes.

Use Clean Tools.—An important point in connection with rose pruning is to use very sharp clean tools. A blunt knife or secateurs leaves a jagged edge to the cut stem, through which disease spores can gain access. Experienced growers usually prefer a sharp pruning knife, and use it with an upward cut so as to prevent any possibility of breaking the stems. Novices more often use secateurs, and now that sharp serviceable secateurs, with a knife-like cut, are obtainable, more and more growers are adopting them for pruning.

Easy Pruning for Beginners.—When the novice reads the instructions already given for pruning roses, he may possibly feel that the subject is too complicated, and be discouraged from tackling his own few bushes single-handed. For the man who has only perhaps half a dozen bush roses in his garden, therefore, here is a simple way to prune them, which will give reasonable satisfaction.

First examine each bush and cut out any wood that has been broken by winter gales, or that looks diseased or shrivelled.

Next cut out the weakest twigs from the centre of the plant so that there is no crowding.

Look at the position of the remaining stems and cut out any that seem too close together, so as to leave, if possible, a skeleton of radiating branches.

Now cut the end from each of these branches, taking off anything from one-third to two-thirds of the stem. One-third of the stem, only, need be cut away if the rose plant is a strong grower, with healthy stems nearly half an inch across. Two-thirds should be cut off if the stems are thin and few in number.

These last cuts should be made at a point on each stem just beyond a dormant bud which is on the outer side of the stem. This bud will be the first to develop after pruning, and will naturally grow outwards from the centre of the plant, instead of growing towards the centre and becoming entangled with other growths.

These rules for pruning can be taken as applicable to every kind of bush rose grown in the ordinary small garden.

Treatment after Pruning.—In order to avoid the spread of disease in the rose garden, all prunings that are cut off the trees should immediately be burned. The ashes can be returned over the rose bed and will assist in keeping up the health of the plants. After pruning, the bed will be lightly forked over, and if some old decayed manure, or old material from the compost pit in a thoroughly rotten condition, is available, it should be lightly forked into the surface soil. If neither of these are

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to hand, a dressing of bone-meal similarly forked-in will be found useful.

Good Sorts to Grow.—There are many kinds of roses and new sorts appear every year. The amateur usually asks for the most reliable sorts to grow and those that will repay him best for his efforts. The following are good bedding roses that have been grown long enough in gardens to be well tried. They are grouped according to colour in order to simplify selections for beds in formal rose gardens:

Deep Yellow: Christine, Golden Emblem, Mabel Morse, Lady Hillingdon.

Pale Yellow: Mrs. Wemyss Quinn, Mdme. Ravary.

Orange and Copper Tints: Mrs. G. A. van Rossem, Mrs. S. McGredy, Duchess of Atholl, Emma Wright, Mrs. George Geary, Mde. Edouard Herriot, Rev. F. Page Roberts.

Pink: Mde. Butterfly, Mrs. A. R. Barraclough, Mrs. Henry Morse, Dame Edith Helen, Lady Inchiquin, Mde. Abel Chatenay.

Salmon Shades: Los Angeles, Ophelia, Shot Silk.

Dark Red: Etoile de Holland, Miss C. E. van Rossem, Hadley, Hortulanus Budde, Chateau de Clos Vougeot.

Bright Red: C. P. Kilham, General McArthur, Mrs. Henry Bowles.

White: Mde. Jules Bouche, Marcia Stanhope, Mrs. Herbert Stevens, White Ophelia, Innocence.

Cream: Clarice Goodacre, Mrs. Charles Lamplough, Barbara Robinson.

Roses especially useful for massed bedding are the Polyantha varieties. These are in flower practically throughout the whole season and give a wonderful display of bloom. The flowers are generally small, but are in clusters and therefore very showy, and the plants themselves rarely grow more than 18 in. high. Some good sorts are as follows:

CORAL CLUSTER, flowers coral pink in colour, small double, produced in huge clusters.

EDITH CAVELL, dark red.

ELLEN POULSEN, bright rose.

GOLDEN SALMON, a good orange colour. The plant grows close and strong.

JESSIE, bright red, close grower.

KIRSTEN POULSEN, scarlet. The blooms are single and large, giving a very fine display of colours.

ELSIE POULSEN, rosy pink. The flowers are similar in shape and habit to Kirsten Poulsen and it is really a most attractive variety.

ORANGE PERFECTION, a very fine orange flower, carried in good trusses.

ORLEANS ROSE, bright crimson, having a white centre.

PAUL CRAMPEL, deep orange scarlet. A very fine rose.

ROSES IN GARDEN DESIGN

PERLE D'OR, light yellow and orange.

YVONNE RABIER, the best white of the polyanthas.

Pillar Roses.—Roses best suited for growing on pillars by themselves are mostly the climbing varieties of some of the bedding types already mentioned, with perhaps one or two additions.

Caroline Testout, General McArthur, Golden Emblem, Lady Ashtown, Los Angeles, Mde. Abel Chatenay, Mde. Ed. Herriot, Mrs. Henry Morse and Ophelia are all obtainable in climbing form and can be relied upon to give a good show. Other good pillar roses are:

LADY WATERLOW, salmon pink.

LEMON PILLAR, pale lemon.

MARÉCHAL NIEL, golden yellow.

WM. ALLEN RICHARDSON, orange yellow.

AMERICAN PILLAR, rosy pink.

PAUL'S SCARLET, intense scarlet.

The Ramblers are specially suited for rambling over arches, banks, etc., and the following are a good selection:

ALBERIC BARBIER, creamy white and shaded yellow.

BLUSH RAMBLER, light rose.

DOROTHY PERKINS, shell pink in large clusters.

EMILY GRAY, deep golden colour.

HIAWATHA, deep crimson with white centre.

PAUL'S SCARLET CLIMBER, very vigorous, semi-double.

TAUSENSCHON, a fine pink. Strong grower.

Standard Roses are grown of most of the best sort of the hybrid teas and, generally speaking, can be chosen from such lists. *Weeping Standards* give especially fine display, for when well trained, their branches hang pendulous from their height of perhaps 5 or 6 ft. and sweep the ground all round, the whole being simply a mass of mingled bloom and foliage.

ARTISTIC PLANTING SCHEMES

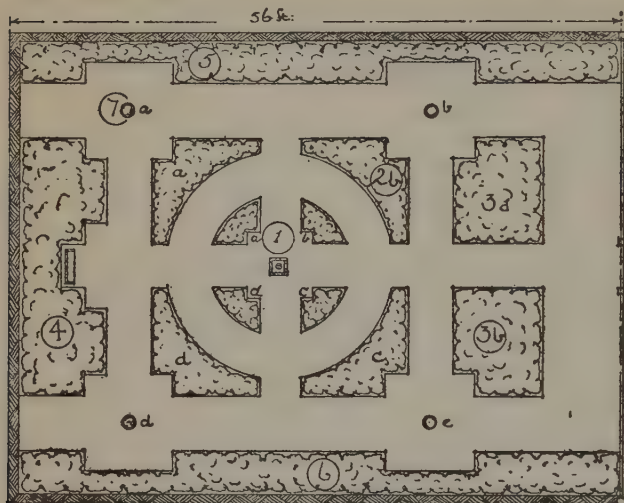
Though many a Rose Garden is made with its planting limited to beds of bush roses, and occasional pillars or arches of climbing or rambling roses, the true rose enthusiast will ask for something rather better. When you begin to love a flower, you find yourself gradually wanting to know it in all its moods, to use it in every possible way, and to become acquainted with its worst as well as its best varieties. Love is, in fact, tolerant of defects, and ready to find some virtue even in the least promising of the species.

The old-fashioned Damask Roses (*Rosa Damascena*), for example, make comparatively little appeal to the average gardener, but the rose fan would not be without them, if only because he has read their history, and respects their long lineage. They were grown in Italy certainly

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many centuries ago, for they were mentioned in the classics. One of them, the "York and Lancaster" rose, so called because of its combined red and white petal markings, is a favourite representative of the group.

The China Rose, or Monthly Rose, parent of most of the modern roses is another favourite with the sentimental grower. Bourbon Roses,



1. Pernettyana:
 - a. Angèle Pernetti.
 - b. Mrs Wemyss Quinn
 - c. Christine
 - d. Margaret Mc Gedy
2. Hybrid Tea:
 - a. Etoile de Hollande
 - b. Georgeous.
 - c. Covent Gardens
 - d. Golden Steam
3. Hybrid Perpetual:
 - a. Ben Cant.
 - b. Mrs. John Laing
4. Rose Species,
Austrian & Climbers
5. 6 Polyantha:
 - a. Paul Crampel
 - b. Alice Amos
7. Weeping Standard:
 - a. Excelsa.
 - b. Ruby Queen
 - c. Dorothy Perkins
 - d. Elise Rubichon

A formal rose garden is very effective if a separate variety is planted in each bed

such as the well-known Zephyrine Drouhin, are mostly grown for hedging. This is a wise use to make of them, especially when a hedge is being formed as a boundary to the rose garden.

Formality softened.—The use of some of the lesser-known species and varieties of roses gives the rose grower an opportunity to lessen the severity of geometrical beds set evenly with bush roses. A rose garden cut out of a hillside, for instance, where the site has been levelled, and one end rises in a rather steep bank, could be made very charming if this bank were set with some of the rose species that are best allowed to grow thick and bushy without much pruning. I would use there plenty of the Sweet Briars, preferably the Penzance hybrids which have showy flowers of pink, fawn, crimson, rose and scarlet.

In the foreground of the bank I should mass some of the Pompon Roses, i.e. the Dwarf Polyanthas. These flower almost continuously from early June until Christmas, and the colours are delicate and range through every rose shade. Owing to the fact that the flowers are in clusters. they suffer very little from rains, but seem to smile through

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tears in the worst of summers. New varieties are constantly offered, and there are about a hundred good ones in trade catalogues from which to choose.

Then I should also grow some of the Musk Roses for their distinctive fragrance. These need a rich soil if they are to succeed. Little or no pruning is required, though weak stems should be cut out from time to time. The plants can also be trimmed back sufficiently to keep them tidy, so they would be excellent subjects to grow near the side walks of the rose garden in a long informal border.

Moss Roses, the hips of which are so loved by pheasants, would find a place in this border too, and so would the single Japanese or Rugosa Roses, which are sometimes used for hedging. They make rampant growth, but can be cut back as desired, and though they are not evergreen, the stems make an effective hedge even in winter.

The Noisettes, of which Wm. Allen Richardson and Maréchal Niel are well-known representatives, might be used if a warm wall could be found for them, but if my rose garden were in a cold northern county, I should give preference to the extra hardy Scotch Roses, which are ideal when grown as standards or tall bushes.

Of course I should try to have one specimen at least of each of the species offered in trade lists to-day, and these include forty or fifty, some well known, and others more rare than lovely. I do not really admire *R. viridiflora*, for instance—the “green” rose—but I should like to own one specimen in my “rose museum” borders.

A garden so planned and planted would give me more real pleasure than the conventional rose garden of square or circular colour beds set in a clipped evergreen hedge, or spreading themselves carpet fashion below a terrace. And to plan a rose garden in this way needs no special knowledge, merely common sense, and sufficient love for the Queen of Flowers to carry the gardener through the voluminous trade lists, and records of the National Rose Society in his search for ideas and information.

Roses for Towns.—One class of roses which must be specially mentioned before we leave this question of varieties and species, is the true hardy perpetual rose. Early in the nineteenth century the Chinese and the Damask Roses were crossed to produce this very hardy member of the rose family. For continuous blooming in unfavourable places, this is the best type of rose to procure. The heavier the soil, the better it will succeed. Hard pruning is unnecessary, but it does result in first-class flowers.

The hybrid perpetual rose is specially suitable for town gardens, where less hardy types are doubtful of success. Frau Karl Druschki, the snow-white rose, and Hugh Dickson, its brilliant crimson rival, are

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perhaps the best known of the group, but others worth growing in difficult gardens are:

ABRICOT, pale coral, dwarf, long season of bloom.

ALFRED COLOMB, strawberry red, large and full, fragrant, handsome foliage.

AMERICAN BEAUTY, crimson-carmine, shaded Neyron-rose; growth upright, strong stem.

BLACK PRINCE, almost black, vigorous growth.

CAPTAIN HAYWARD, scarlet crimson, free; flower large, not quite double, blooms in June.

CHARLES LEFÈVRE, deep velvety crimson.

CORONATION, deep flesh, shaded shrimp pink, few thorns, upright growth.

DUKE OF EDINBURGH, brilliant velvety crimson.

EUGENE BARBIER, deep golden-yellow, shaded copper-red, rich green foliage, very hardy.

FISHER HOLMES, crimson, shaded scarlet, long-pointed bud.

GENERAL JACQUEMINOT, brilliant scarlet, very fragrant.

GLOIRE DE CHEDANE GUINOISSEAU, brilliant red.

HENRY NEVARD, crimson scarlet, very fragrant; long season of bloom.

LOUISE CRETTE, pure white, very fine.

MRS. JOHN LAING, soft clear pink, bud large and pointed, light green foliage.

MRS. R. G. SHARMAN CRAWFORD, clear pink.

PRINCE CAMILLE DE ROHAN, blackish crimson, very dark.

REMBRANDT, salmon, tinted orange-red; large strong foliage; hardy.

ULRICH BRUNNER, cherry crimson, large, very fragrant; several blooms on a stem.

VICTOR HUGO, intense brilliant crimson, free bloomer.

In addition to this group, there are some of the rambler roses which are good for town gardens. "American Pillar," "Alberic Barbier," "Excelsa" and "Paul's Scarlet Climber" are all excellent for pillars and archways in smoky districts, and though I have not tried it, I imagine that "Easlea's Golden Rambler," which has such fine glossy foliage, will be another rose that takes kindly to the town garden.

It is perhaps worth while to note here that more roses can be grown in towns than most gardeners believe. Almost any of the strong growers with glossy foliage will succeed, so long as they receive a fair amount of sun, and the soil is kept sweet by an annual dressing of lime.

Single Roses for Indoor Decoration.—Roses make a finer indoor decoration than any other flower. This is said deliberately, and though every Carnation, Chrysanthemum, or other flower "fan" will reply by shouting the claims of his particular favourite for the sovereignty of the

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vase, the rose will stand all the criticism that can be levelled. Rose foliage is lovely when well grown and clean, and roses display well if they are well grown, and in particular the single roses, which have become such favourites during the past decade, make most effective table decorations. Sulphur-yellow "Mermaid," bronze-red "Irish Elegance," carmine-scarlet "Isobel," and salmon-pink "Dainty Bess" are all varieties which I have known to take First Prize in more than one Show in the decorative classes.

Budding.—This is the insertion of eyes taken from the sound healthy wood of the rose, and inserted under the bark of a parent stock, usually the wild dog briar. Take the bud from a ripe shoot—that is one which is mature enough to be able to bear flowers. Test by rubbing over the prickles, as these fall off easily if the shoot is in fit condition, plump and firm. Shoots must be put in water if the buds are not immediately used. The leaves must all be removed close to the base of the leaf stalk. Then cut the bud out of the wood with a sharp knife, making a shallow curve behind it so that the bud sits half way along a thin strip of bark and wood. When the knife is nearly through, pull away so that you leave a thin strip of hanging bark on the end of the shield. In this way you will be able to strip the wood from the bud without bruising the bark, which is important.

To remove the woody part, hold the piece by the bark on either side of the leaf stalk and slightly pull back the thin strip of bark so as to free the wood. Be very careful not to take the bud with the wood. Then cut the bark at the bottom end of the bud half an inch from it in the shape of a V.

Preparing the Stock.—In a standard, the place for budding should be on two of the three young shoots which have been left near the top of the main stem. The bud should be inserted as close to the base of the shoot as possible. With bush roses scoop away the earth to expose about 3 in. of the main stem, and clean it thoroughly from earth and grit. Insert the bud in the method described in Chapter XVI. Speed is an advantage in the operation. In dry weather the stock should be watered well and shaded for a few days. If a bud dies, another should be inserted on the opposite side of the stem. This work is done between June and September, standard briars being treated first.

After Treatment.—If the budding has been successful, i.e. if the bud swells instead of shrivelling, cut all the branches of the standard stock, except those which have had buds set in them, clean away with a sharp pruning knife, and those that have been budded, cut back to within two or three buds of the inserted one. This must be done during November. These two or three buds are left, as the foster bud alone has not yet the strength to draw up sufficient sap and would be starved. About

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May the stock should be again examined. Remove all buds below the scion and allow those budded to grow 4 or 5 in. only, then pinch off. In dwarf varieties, cut off the head of the stock early in March, leaving 2 or 3 in. of the stem, which will be cut away at pruning time in the following March. Carefully stake and tie all budded roses.

Cuttings.—Roses that do well on their own roots and are mainly propagated from cuttings. Climbers, ramblers, many hybrid perpetuals and hybrid teas can be rapidly grown in this way. Take cuttings from well-ripened wood, with a good number of strong healthy leaves, when the roses have finished flowering in early autumn. Insert them in a cool, shady border facing north or east, and they will root well in the open air. Choose a shoot about 10 in. in length which has borne a flower and cut it off just beneath a bud with three or four leaves attached. Set the cuttings firmly 6 in. apart and 6 in. deep. Water them in well and give a morning and evening sprinkle. In frosty weather it may be necessary to firm the cuttings back into the soil. Cuttings do equally well, sometimes better, planted in pots, or a handlight or cold frame may be placed over them to encourage rooting.

Layering.—Layering is easy, and generally successful. It may be done at any time of the year, by making an upward cut just below a joint in the shoot to be layered, from about $1\frac{1}{2}$ –2 in. in length, and pegging it firmly down into the earth. See that the open tongue comes well in contact with the soil. The soil should have been well stirred, and a little mound of soil can be piled over the layer, which is pressed firmly into place and well watered. An addition of sharp silver sand to the soil used (fifty-fifty) helps rooting. Remove any buds not required to form shoots in the new plant. In about twelve months' time the layer will be ready to be cut away from the parent plant, potted up, or planted out.

HOW TO HYBRIDIZE.—When one rose is cross-fertilized with another, it may produce an entirely new variety. For this purpose a small dry greenhouse must be set apart.

Young rose plants of good varieties that naturally pod freely must be procured and allowed to grow on slowly, watered and syringed exactly as if grown for normal purposes. Mildew must be treated with flowers of sulphur, and should green fly appear the plants should be fumigated. In April, operations can be started as soon as two or three blooms are out. The apparatus needed is a small pair of sharp-pointed scissors, a small camel hair brush, a few pill boxes, labels and a note-book.

Pluck out the inner petals of a partially developed bloom until the eye is disclosed. Cut away the male stamens. These surround the centre cluster of shorter female carpels, which are probably not ripe for crossing.

Select now a bloom of some other variety with which the cross is to be made and again pluck out the centre petals. When the stamens of

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these flowers become dusty with pollen and sticky film appears on the surface of the pistils of the first plant, the cross can be made. Either the pollen may be taken away from the flower, or the bloom may be cut off and carried to the prepared flower to dust the pollen on it. If blooms are scarce the first method is better, otherwise to cut off a flower may be recommended as ensuring the loss of no pollen. To save the bloom, while using the pollen, the male stamens are removed and tilted carefully from the flower into a pill box, from this the pollen can be taken up with the brush and put on the flower awaiting it. The plant should be labelled with a figure or number and recorded in the notebook. Care must be taken to keep the air of the house as dry as possible to prevent the damping-off of the special plants. As time goes on the pods will swell, and by January it will be time to think of sowing the seeds. This must always be done under glass.

Take tiny thumb pots, about $1\frac{1}{4}$ in. across the top, and sow each seed singly, soil mixed with coco-nut fibre or leaf-mould being used. Plunge the pots into a thoroughly moist, finely-sifted cinder ash bed about 3 in. deep. Label carefully. A sprinkling of fine silver sand on the surface will keep the soil from becoming mossy.

When the seedlings are developing, water on a bright day, using a fine spray with water of the same temperature as the house. They are not rapid growers, but they will in time make sufficient growth to be carefully tapped out of their little pots and replanted into slightly larger ones filled with good gritty loam. It is essential not to disturb the soil of the first pot.

If space is limited the seeds can be put in rows in a fibre bed, again being carefully labelled. They are slower germinating in this way unless supplied with a little mild bottom heat.

Briar cuttings should be rooted in the garden as they will be needed to bud with eyes from the seedlings, when they are sufficiently grown. After flowering, the seedlings themselves may die off, and unless an eye or two is secured and budded upon the growing stock the new variety may be lost. Varieties which bud freely are Madame Abel Chatenay, Betty Upchurch, Los Angeles, Golden Emblem, Ophelia, Madame Herriot (the *Daily Mail* rose).

If the first batch of seedling roses are good in growth and habit it is better to continue to cross these. A distinct and valuable rose is more likely to result. The rudimentary principles of hybridizing are simple. Hybrid perpetual roses crossed with others of the same class will give hybrid perpetuals again. Hybrid perpetuals crossed with Teas will give Hybrid Teas.

Three years at least are needed before the grower can tell whether the progeny is of any real value or not.

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Roses under Glass.—Roses can be bought any day in the year as cut flowers if the price can be paid. The winter ones are necessarily greenhouse grown.

For the smaller greenhouse the best method for producing flowers is by pot plants. Top dress them with fresh soil, manure in the autumn, and bring them into a cool greenhouse. Give little water, and about a fortnight later prune hard back to three or four eyes from the base. This applies to all the ordinary Pernetianas and Hybrid Teas. Weak and useless wood must be cut out and the pots set on a thin layer of cinder ashes. In sunny weather keep the atmosphere moist and syringe the heads daily, using water of the same temperature as the house.

If a pot, when tapped, gives a dull soft sound it is moist enough; if a sharp high sound it is too dry. Water standing on the surface indicates that the drainage is blocked, and a small piece of stick must be thrust into the drainage hole to loosen the blockage.

Ventilate the greenhouse from the top, but as draught causes mildew be wary on a cold or windy day. Flowers of sulphur dusted on will cure mildew and fumigating will destroy Green Fly. Maggots and Caterpillars must be dealt with by hand picking. When watering, a weak solution of liquid manure (such as cow droppings and soot) can also be given, or a light dressing of Rose fertilizer dusted on the surface of the pot.

With a powerful sun, light blinds may be needed for shade. Alternatively syringe the roof and sides with a mixture of skimmed milk and whitening.

Forcing for Winter Flowering.—For this purpose pot plants must be taken under glass in the very early autumn and given considerable heat. Ordinary plants from the open ground cannot be forced in the first season, but must remain in a cool frame and allowed to flower a little about May or early June, only being forced for early flowering the following winter when their roots are well established. Climbing Roses planted out in the greenhouse, such as the climbing Niphetos, Fortune's Yellow, or Maréchal Neil need pruning each season. The weakest shoots must be cut hard back each year to encourage new growth from the base, and the long shoots shortened by about a third.

Rambler Roses require little pruning except to take out all small stubby growth, and tip the ends of the longer shoots. In flower they take quantities of water.

A Rose for the Rock Garden.—For a rockery, a charming little Rose never more than 9 or 10 in. high is *Rosa Rouletti*, which is covered all the summer with pretty pink tiny Roses. It is probably a remote descendant of the Persian Rose, and was discovered in a Vaudois village a few years ago.

CHAPTER IX

ROCK GARDENS—CONSTRUCTION—PLANTING—LIST OF POPULAR ROCK PLANTS—LISTS OF PLANTS FOR SPECIAL PURPOSES

ROCK GARDENS

ONE reason why a rock garden is such a popular feature amongst amateur gardeners is that it can be any size from a square yard to a square mile. It is hardly too much to say that there is as much interest to be found in the cultivation of a small rock garden as in a larger one. In many cases there may be found *more* interest, owing to the fact that the type of rock garden that would be made in a small space would probably be one that contains rare Alpines. The larger rock garden would more probably be designed on spectacular lines as a piece of natural landscape with bolder planting of subjects that are more common in gardens.

Obviously the first thing to do in considering a rock garden is to decide what type it shall be, and this involves questions of site, locality, and cost, as well as personal preferences. If the garden is being made on a sloping hillside, the rocks could be introduced either in the form of a sloping rock garden, or in the form of a rockery retaining wall between sections that are levelled to form terraces. In either case, Alpine plants of many kinds can be grown with picturesque effect.

If a rock garden is to be made on a site that is perfectly level, considerable excavation and building-up have to be done. This, of course, adds to the initial cost, but it makes comparatively little difference to the subsequent cost of upkeep.

CHOICE OF STONE

One of the problems which must immediately be decided is what kind of stone shall be used. There is a very simple rule which can be followed by amateurs in this connection; that is, to use the *cheapest available good stone*. It will be found that in most cases this works out satisfactorily from an artistic point of view. In the first place, the cheapest stone is probably stone which is quarried locally, and this stone is generally best suited to the surroundings of the garden. In some cases, it will be stone similar to that used for architectural features in

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the house (for instance where houses are built of stone as in midland rural districts). It is also the stone which is likely to be somewhat similar in nature to the soil of the locality, and plants that will flourish in the ordinary soil of the gardens will find an equally happy home amongst the local rocks.

In the case of a small garden of a developing Housing Estate near a large town this matter of stone assumes a somewhat different aspect. In all probability the house is built of artificial brick, and there is no possibility of making the rock garden associate closely with the surroundings. It is therefore, æsthetically, immaterial what type of stone is used.

Water-worn limestone is regarded as being the best and most artistic for rock gardens conceived on a large scale, especially for rock and water gardens. Smaller pieces of weathered limestone are suitable for small rock gardens, and make the finest of all homes for a large section of Alpine plants.

Sandstone of various types is quarried in many districts, and is not inferior to limestone in many respects. It is of a porous nature, and consequently holds sufficient moisture for rock plants, and it very quickly weathers to a mellow hue. Where sandstone can be obtained from local quarries it should certainly be used in preference to paying larger sums for limestone.

Another stone frequently used for rockery construction is tufa, a volcanic rock. This again is excellent for certain plants and not unsuitable for any type of rockery construction. Granite is a stone which is generally regarded as inferior by gardeners. It makes a lovely rugged and imposing rock garden, when it can be used in very large pieces.

The amateur who builds his own rockery is however advised to ignore granite as a possible rock, as the size of stones necessary to make a really grand imposing garden would be impossible to move without machinery. All this however, concerns the amateur gardener who has at his disposal sufficient funds to make a choice possible.

SUBSTITUTES FOR NATURAL STONE

Some gardeners would advocate eliminating all rock gardens from the garden layout unless the ideal stone can be obtained, but so many really lovely and artistic little rockeries are made by amateurs all over the country, that this seems an unnecessary restriction. Necessity is the mother of invention, and the really keen amateur rock gardener who cannot afford limestone or sandstone will make a very good attempt by using large flints taken out of the subsoil, old bricks left by the builders, lumps of cement foundation obtainable cheaply from house-breakers, and so on. Concrete, mixed in the proportion of one part cement and two parts sand, and run into containers of various shapes and sizes, makes

ROCK GARDENS

efficient rockery stones, and if these are built in a careful manner, and set with small creeping plants which will quickly encroach over the rocks, a very natural-looking rock garden is soon created.

How to Begin.—The first step in making a rockery is to decide roughly on the contour; that is to say, to decide whether you will have a rockery mound, rising between paths, or at one end of a lawn, or a deep ravine with a path along the bottom and rocky slopes on each side, or whether the rockery garden is to be built in the form of a steep slope with water trickling from the upper level in a series of cascades to a pool at the base, or with a rocky "mountain path" descending down the slope instead of water. Any of these ideas can be carried out quite simply, even in a small space. On a natural slope, the imitation mountain side will be easiest to construct, but on a flat site the style is not very material. Soil has to be excavated at the sides to form the central mould or in the centre to form a ravine.

Soil Disposal.—The rock gardener must not forget that the top spit of soil is always most fertile. Where the making of the rock garden necessitates much excavation and alteration in contours, the best plan is to strip off this top fertile soil, and to pile it in a heap at one side while the general outline of the rock garden is being built up. In the case of a very small rock garden the next step would be to trench the soil all over the site, and to fill in at least a 6 in. layer of rough material, such as gravel, or old bricks below the subsoil. This ensures good drainage over the whole of the rock garden. The subsoil is then roughly re-built to the desired form.

If a ravine is constructed, the sides should not be of an even slope, but should be wavy in outline. Where it can be so arranged, the steepest slopes should be on the sides facing the north, while the sunnier south slopes are not so steep. This not only means that the plants will suffer less from lack of moisture on the hot sunny slopes, but it also provides a larger surface area of rockery pockets in full sunshine, and the majority of rock plants are sun lovers.

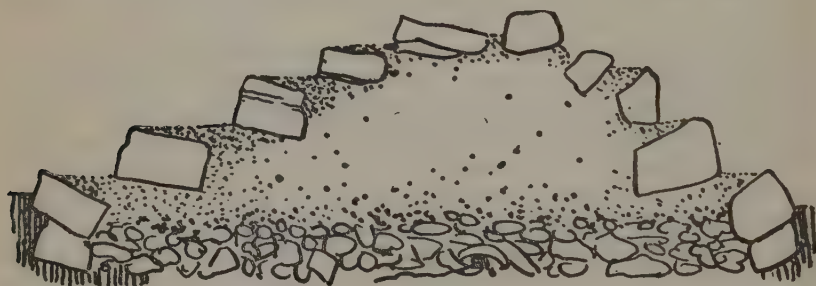
It is because rock plants love sunshine that a rock garden should always be built in an open sunny part of the garden. The idea of putting a rockery *where nothing else would grow*, such as under the drip of trees, has fortunately disappeared in most gardens. Hardly any of Nature's rock gardens are made under such conditions. There are of course charming rocky dells, in deep crevices in the limestone hills, and other similar situations, but in such places the majority of the plants grown are ferns and other foliage plants, and not the brightly coloured flower masses which the amateur probably wants in his rock garden.

Setting the Rocks.—It is in the placing of the rocks in the garden that the amateur gardener shows his artistic taste. The actual building

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is done from the bottom upwards. Each stone is selected with care and is so placed that it is both quite firm in the soil, and at the same time slightly tilted inwards into the slope of the ground. The reason for the tilt is that rain, as it falls, will travel naturally into the rockery, where the plant roots are waiting for it, and not be carried away down the outside. Stones so placed will form natural ledges to support the soil, that is to say, there will be "pockets" of soil, in which plants can be set. This method of building gives a natural appearance. Nature's own rock gardens are formed where stones have crashed down the mountain side

CORRECT WAY TO BUILD A ROCK GARDEN.



TIP THE STONES SLIGHTLY
TO ALLOW MOISTURE TO
DRAIN INTO THE CENTRE.

A foundation of rough stones will help to make your rock garden a success by providing effective drainage

and lodged in this position, and fine soil has been washed down after them and been caught by them in natural pockets.

If limestone is used, the weather-worn lichen covered portion, which is the most artistic in appearance, will naturally be put upwards. Very round and very flat stones will both be avoided in the main part of the rockery. The round stones can be used in informal pools where water ripples, and flat stones can form part of the rockery paths.

If there is a natural strata to the rocks, that is to say, if they are lined with parallel lines, these should mostly be placed so that they are

ROCK GARDENS

uniformly horizontal or sloping. This again gives a picturesque appearance to the garden, as if there were a natural outcrop of stone.

Making a Cascade.—It is really far more simple than it seems to make a cascade of water in a little garden. It can be done in any garden when a tap can be arranged at the highest spot of the rock garden, and a lily pool or sump arranged to take the surplus water in the lower part of the rock garden. In some cases it may be possible to take the water back to the main drains. Many amateurs have made rock and water gardens in this way, using the water from the house and outbuilding, and the possibility of such a feature should be considered when a new rock garden is built. (For fuller details *see* CHAPTER X. WATER FEATURES.)

Moraine Gardens.—There are in Nature two kinds of moraine, both the same except in the matter of age. As a glacier recedes (and all our European glaciers are gradually receding) it leaves in its wake a pell-mell drift of stones, often piled in one place by the meeting of two glacier streams. At first these are partly covered by icy water flowing from the glacier. In time these stones, and also the soil formed by the breaking up of the softer material, are left high and dry, with no icy water, but only the rains of heaven to sustain the plant life among them.

It is naturally impossible in British gardens to reproduce the conditions of the first described moraine, where icy water still trickles through the stones; but the rather older moraine, where most of the water has gone, and the surface stones are dry at all times, can be reproduced. If, at the same time, a subterranean trickle of water (such as the escape of a rockery cascade) can be allowed to pass under the artificial moraine, a fairly cool root run will be secured, and this will give the nearest possible resemblance to the natural moraine that the rock gardener can contrive.

One of the easiest ways to reproduce moraine conditions in an ordinary garden is to use a bank, preferably one facing south, with a gradient of not more than one in ten. A large number of small stones, weathered and water-worn, plenty of grit, and a little soil, are needed for building. (If water naturally oozes from the bank, so much the better.)

Put a layer of coarse sand at the bottom, add the stones and grit, and mix a little fibrous loam with the grit as you work. It is an advantage if this type of garden is above the ordinary level, as moraine plants are very liable to suffer from surface damp.

SCREE GARDENS

An alternative garden which can be built with similar materials, but where the soil is dry and water cannot be introduced artificially, is the scree garden. Where a steep mountain is crumbling, showers of small and large stones rush down to lower levels, and form fan-like heaps against the rock sides. It is hard to imagine a more uncongenial spot

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for plants than this, but such is the adaptability of vegetation that some plants have developed a fondness for this situation, and thrive best when showers of small stones are frequently washed down on to them from higher levels. *Campanula allionii*, *Petrocallis pyrenaica*, and certain of the *Kabschia Saxifrages* are frequently found in heaps of stones piled against tall cliffs.

A scree garden is built on much the same lines as the moraine, but leaf-mould is used with the bottom layer of sand. Deep-rooting subjects need this for moisture and food.

WALL GARDEN

As already mentioned, a rockery sometimes takes the form of a wall garden. This may be either a retaining wall between two levels on a sloping site, or it may be a division wall, built on the same principle as a retaining wall, but with wall stones on both sides and soil filled into the hollow between the rocks. It is desirable to make a slope of about $1\frac{1}{2}$ ins., in each foot from front to back, so that the face of the wall is not quite vertical. Special rock stone is sold for building walls, usually in small pieces a few inches thick. Any kind of stone, however, can be used if necessary, the secret being to pack between the stones sufficient rich but sandy soil to sustain the plant roots. Stones must be set very firmly and here and there larger or longer stones must penetrate from the front well back into the bank or soil, or in the case of a double-faced wall, a long stone must here and there lie across the whole width of the wall, in order to give it security.

Plant Wall Gardens as you Build.—It is much better and much easier to set the plants in a wall garden as building is being done. Some of the plants succeed better in the vertical crevices than in the others, and also planting is often extremely difficult when the wall is finished.

Should it be impossible to plant during building, the best thing to do later is to mix suitable seeds with a little soil and sufficient water to make it moist, and to press this well into the crevices between the stones. The seeds soon germinate, and establish themselves more quickly than do small plants set into the wall crevices.

SPECIAL TYPE ROCK GARDENS

Are dealt with in the chapter on "Water Features," but certain other rather distinctive types of rock gardens may be mentioned here. One that has recently come into popularity is the "Heather Garden." This is a type very suited to parts of the larger garden made in a district where heather grows plentifully.

There are innumerable good varieties of heaths (*Ericas*) which flower at varying periods practically all the year round. Set with these, a

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garden of suitable sandy peaty soil would rapidly become furnished with plants that need only the minimum of attention. A Heather Garden can in fact be regarded as one of the most labour-saving types that can possibly be made.

Another distinctive kind of rock garden is the *Alpine Meadow*. The natural Alpine meadow is of course, as its name suggest, a rich grassy meadow such as is found in the Alps. The soil is very fertile, and the grass grows freely, while among the grass grow innumerable flowers, such as Anemones, Colchicums, and so on. In the amateur's garden it is impossible to allow ordinary grass to grow too freely among flowers, since it becomes far too ragged and untidy unless it is mown. What the amateur gardener calls an *Alpine Meadow* is therefore a fairly flat and undulating part of the garden, with perhaps rocks protruding here and there over the surface, a general appearance of greenness, and occasional splashes of bright flowers. To paint this restful picture he uses such plants as Cotulas and Arenarias for the green carpet, and groups of dwarf bulbs and other floral gems scattered here and there over them. Grass can be used, but if so, it should be restricted to those parts of the meadow garden which are not close to the rocks, leaving an opening of prepared soil round each protruding rock, in which can be set the flowering rockery plants. Little groups of spring bulbs nestling against large stones, a few Primulas, Irises, and ornamental grasses, also set close to the protruding rocks, and an occasional dwarf shrub such as a Pyramid Cypressus, or low spreading Yew, add to the appearance of the picture. The grass walks between the rock and flower patches must always be kept close mown, though they can be undulating instead of flat like an ordinary garden path. If moisture collects, the stones may be useful as "stepping stones."

PLANTING SCHEME

The type of planting to be used in a rock garden depends largely on its size and construction. A very large rock garden can be planted generously with the sort of plants that are naturalized in wild gardens, Spiræa, Valerian, Foxgloves, Monkshoods, and plants of smother growth such as Cerastium, Arabis, Aubrietia, and Thrift.

Rock gardens which include patches of grass, can be set with spring bulbs, Primroses, Cowslips, Anemones, and hardy Orchids.

The small rock garden, where space is precious, may well be devoted to the cultivation of rare Alpines, such as Gentians, Androsaces, Iris (susiana and stylosis) Ramondias. Small bulbs can be allowed in every type of rockery, but the ordinary spring bulbs of the border are best ignored in rock-planting schemes. The little Grape Hyacinths and "Hoop Petticoat" Narcissus, Scillas and Anemones go fairly well with

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rock plants, but the more imposing Daffodils and Hyacinths seem somewhat out of place in the rock garden.

CULTIVATION OF ROCK PLANTS

In general, the cultivation of rock-garden plants is on fairly similar lines. They are mostly dwarf plants and require fine soil in which to grow and to seed themselves. At the same time they like soil which is well drained, and, therefore, sharp gritty sand is added to the compost when the boxes are prepared.

The commonest plants of the amateur's rock garden can be roughly divided into groups according to cultural treatment.



Dwarf plants scattered amongst the paving stones of a pathway give a colourful old-world effect

First there are spreading, creeping plants, of thick, tangled growth. To this group belong such plants as Arabis, Mossy Saxifrages, Pinks, Thrift, and Cerastium.

Nearly all the plants in this group can be raised equally well from the seed or by division. Seeds do not always come true to type, but seedling plants are always healthy and interesting.

If it is intended to raise them from home-saved seed it should be gathered as soon as ripe, and not allowed to disperse itself naturally.

It can be sown at once, in pans of gritty soil or, if more convenient, it can be saved until the following spring.

The preparation of the seed pans to be used for Alpine seeds is on

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the same lines as for ordinary seed sowing, except that, as a rule, shallower pans are used and the seed compost must have an extra large proportion of sharp, gritty sand.

Drainage should be well provided for by means of broken crock and rough material at the bottom of the seed pan. The seeds are covered only with a fine dusting of sand.

Seedlings are picked out as soon as they are large enough to handle, and grown on under cool conditions, as most of these plants are perfectly hardy, even in the seedling stage.

While the seeds are germinating, the seed pan is covered with a sheet of glass, and until the seedlings appear it is shaded also, by laying over it a sheet of paper. The glass will be lifted daily and wiped, otherwise surplus moisture collects on it and may drop on to the seed and set up the disease known as "Damping off."

As soon as the seedlings appear, the glass can be dispensed with entirely. Water should be given as required, and the best plan is usually to immerse the seed pan in a bowl of (rain) water, so that the water soaks upwards without washing out the seeds.

The vigorous-growing rock plants can also be increased by cuttings or division. When the plants have flowered, it is usual to cut them back rather severely, as they spread rapidly and may easily choke rarer Alpines.

The pieces that are cut off will all root if dibbled into sandy soil. They can be set in rows close together in any shady, moist part of the garden. With these rampant growers there is usually no necessity to use a propagating frame. Usually, any that are found difficult to rear in the open garden can be readily rooted if they are inserted in a frame or under a bell glass (which helps to keep the atmosphere moist round them until the roots have formed). In the case of *Arabis* or of Mossy Saxifrages, some of the crowded green tufts are usually just pulled off and dibbled into the soil without any further preparation.

Another group of rock plants consists of those compact Alpines (frequently rosette-shaped), which do not readily spread, and are therefore not so easily increased by cuttings or divisions.

In such cases it may be essential to increase by seeds, which are sown as already described for the carpet plants.

It is natural for rock plants to seed themselves, and for the seeds to be self-sown immediately they are ripe. In some cases the seed does not germinate quickly, but may lie in the soil for months or even years.

The common practice amongst rock gardeners is to follow Nature and to gather the seed as soon as it is ripe. In the case of rare Alpines they sow one-half immediately, and reserve one-half for sowing the following spring.

If the seed seems slow in germinating, and no signs of the seedlings

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are visible, when snow weather occurs, the seed pans are allowed to stand in the open and to be smothered with snow; this appears to help germination.

Pans containing seeds of rare Alpines should not be disturbed until there is no possibility of further germination taking place, as the seeds frequently germinate in somewhat erratic manner.

Cuttings under Glass.—Propagation by cuttings is a simple method of increase with any type of rock plant from which cuttings or non-flowering rosettes can be removed. To be more certain of success with difficult subjects a propagating frame is used, and in this the cuttings are rooted, in pure silver sand. This medium is ideal, since it does not encourage "damping off," and if the atmosphere of the propagating frame is kept moist almost any rock plant cutting can be rooted there satisfactorily.

It is probably a mistake to "make" cuttings too carefully. The majority of rock plants root easily if pieces are pulled out and inserted as cuttings without any further preparation.

Where preparation seems advisable, the lower leaves are stripped off (as in the case of larger cuttings) and a clean cut made just below a joint.

One other method of increase is common amongst rock plants; that is, by root cuttings. Any rock plant which has thick fleshy roots can probably be increased in this way. (See CHAPTER XVI. PROPAGATION.)

GENERAL MANAGEMENT

The general management of the rock garden consists in removing weeds, keeping the soil surface as open as possible by occasionally disturbing it with a hoe or a special rockery tool, cutting off dead flowers (unless seed is required) and occasionally top dressing the surface of the pockets.

Top dressings vary according to the type of rockery plant being grown. Tender Alpines, which are apt to "damp off" in very rainy or cold weather, are best top dressed with small stone chips. This slight attention will preserve many a tender rock plant in the open through worst winter days.

Where the soil gets washed away from the crowns of the plants from time to time, a top dressing of the following compost can be used: one part sharp sand, one part decayed leaves, two parts fibrous loam, all rubbed through a $\frac{1}{2}$ -in. sieve.

A little lime rubble, crushed, and used as a top dressing round some of the lime-loving plants is also beneficial.

Rock plants, as a rule, like to remain where they are without disturbance for a number of years. Small rockeries in town and suburban gardens are apt, however, to become sour by the constant washing of impurities from the atmosphere, and it does no harm to rock plants if the rockery



Seemingly better than grows in a steady stream of the garden. It has light blue flowers with golden stamens

Photo: Carters

1. *Mixed Polyanthus* massed in a bed on the lawn will make a bright display during the early months of the year



2. *Pentstemons* can be planted out in May to add colour to the mixed flower border

3. *Yellow and bronze Wallflowers* should be planted for their fragrance and bright colouring in early spring





1. *The annual Asters in mixed or separate colours can be used for bedding schemes*



Photo: Suttons

2. *Heliophila is a June-flowering annual from the Cape. It has sky-blue flowers*



3. *Cosmeas, with their dainty colourings and finely-cut foliage, are graceful flowers for indoor decoration*



1. Annual Scabious vary in colour from white, soft pink and yellow to deepest purple



2. The single annual Chrysanthemums are ideal cutflowers. Golden Glory is one of the best new varieties



3. Here is a new type of Calendula—
"Chrysantha"



Sweet Pea, Fantasy is one of the new striped varieties. The colours are rich chocolate maroon on cream

Photo: W. J. Unwin



These three flowers, Sweet Peas, Pansies and Carnations are all important enough to have a special society devoted to their interests



1. A border of Irises can be of interest through most months of the year by choosing varieties which give a succession of bloom

2. The English Irises, of which there are several named varieties, grow well in town gardens



3. *Iris Talisman*, is a new June-flowering Iris, bright yellow in colour

4. *Iris unguicularis* has lavender-blue flowers in January and February



The dwarf or Mignon Dahlias almost rival the Geranium for brilliant bedding effects. They also make fine pot plants



1. The dainty fronds of Maiden-hair Fern enhance the beauty of Roses when arranged for table decoration

2. The Queen of Flowers looks just as charming in a stone pot as in an expensive vase



3. Formal beds in grass look well with one variety of rose in each

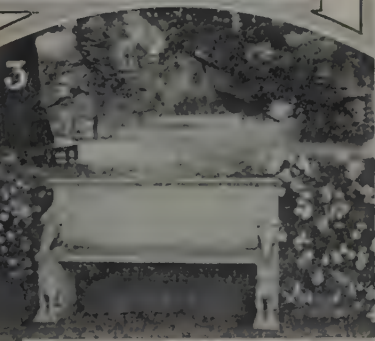
Photo. Bakers

1

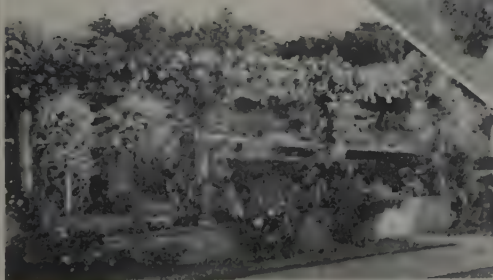
1. A single Rambler Rose will quickly cover a small garden arbour



2. A home-made larch pergola makes a pleasing support for Climbing Roses



5



3. Clusters of scented Roses add to the welcome of a garden seat

4. The beauty of architecture can be enhanced by the restrained use of Climbing Roses

Photo: The Hortiphot Co.

5. Roses are quite at home on this stone pergola with its substantial wooden crossbars

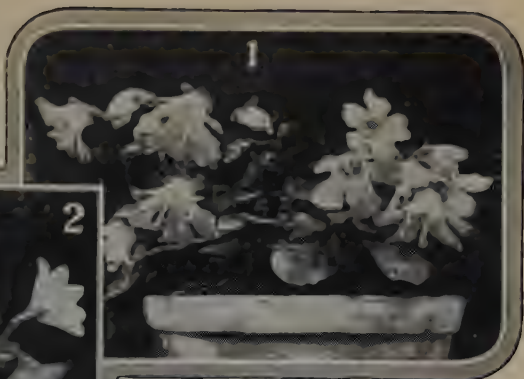


Photo: Albert Steiner

Masses of golden *Trollius Europaeus* as they are seen near St. Moritz in June

1. *Lewisia* is a useful rock plant, bearing pink flowers in July

2. *Shortia* is attractive on the rock garden in winter because of its crimson leaves. Its blush-white flowers appear in May



3. *Oxalis* or Wood Sorrel is at home on the rock garden

4. A rock garden at the height of its spring beauty

5. *Morisia* has very much divided leaves and bright yellow flowers in May

Photo: Kodak

1. An informal pool planted with Water Lilies is always attractive

2. Water can be employed in the Japanese garden with good effect

3. A wall fountain below a terrace jets its water into a rill and formal pool. The tall figure could be viewed by those seated on the terrace

Photo: Carters

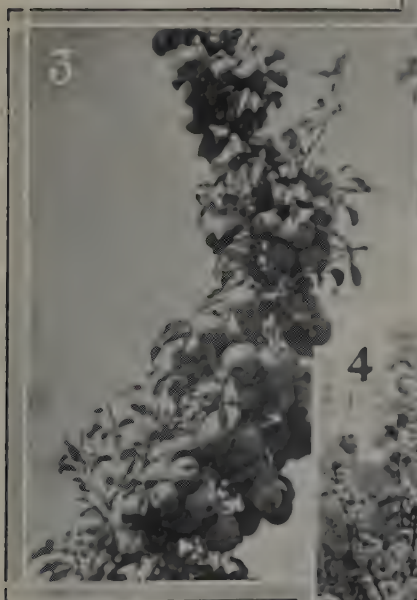
Photo: H. J. Ludlow

4. The "Girl and Shell" fountain



1. An old Apple tree surrounded by grass makes a decorative garden feature

2. Cox's Orange Pippin is a favourite dessert apple. Its season is from November to February



3. Pear Beurre d'Aremberg is a delicious, juicy variety at its best from December to January



4. Bush Apples in the height of their spring glory

*Harvesting crops
is an important
part of the gar-
dener's work*



*1. Potatoes left to dry on
the surface for a few
hours*

*2. Tops of onions bent
over to promote ripening*

*3. Runner Beans should be
gathered young*

3



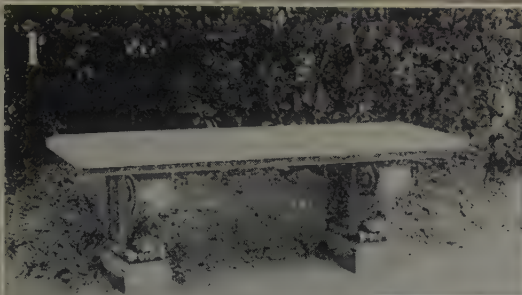


Photo: Revitt

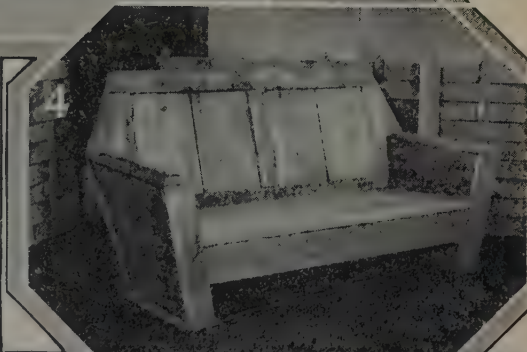


Photo (4) : Rural Industries

Photo (5) : Gordon Russell



Photo: Hughes Bolckow

1. A stone bench is appreciated in a sunny corner of the garden
2. Wooden painted seats form a pleasing contrast with dark, evergreen shrubs
3. A light wooden seat easily moved, is a garden asset.
4. A substantial wooden seat should be placed where it commands an interesting view
5. Garden seats may be artistic in design as well as comfortable
6. A light table is invaluable to the summer garden

Photo: R. W. Farman

1. *Woven osier furniture is comfortable and durable.*



3. *Odd chairs for use near the tennis court should be light and in harmony with garden colour-schemes.*



Photo: Dryad

2. *Light cane furniture helps to make the summer garden an extra room.*



Photo: Pel

4. *Woven and steel furniture is very suitable for garden use. The advantage is that there are no legs to spoil the lawn*

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is treated in the same way as the herbaceous border; that is to say, if it is renovated triennially.

The best time to do this is towards the end of summer, when most of the rock garden plants are at rest. The large rocks may be removed, and the plants temporarily heeled into some other part of the garden. The rockery can then be completely renovated, adding some fresh soil, and dressing the old soil with lime for use again in the remade rockery. Lime helps to purify it. The rock garden will then be rebuilt on the lines already laid down, and the plants set back in position as the building proceeds.

ALPINES



ANDROSACE VILLOSA.

IRIS LACUSTRIS.

MIMULUS

Some Alpines thrive in a sunny spot and others in a moist one. This means that care should be taken when selecting plants for your own particular sites

THE ROCK GARDEN IN WINTER

Special care must be taken over the rock garden plants during the winter. Cold is not the chief trouble; rain and fogs are far worse problems. That is why a top dressing of stones is useful round the crowns of the plants. It prevents the collection of moisture on this vital part. It is also wise, in many cases, to shelter the plants by using bell-glasses or Alpine protectors, which take the form of sheets of glass supported by wires so that they are held roof-like above the tender plants, and divert the rains.

PLANTS FOR THE ROCK GARDEN

The following is a selection of rockery plants suitable for planting in the pockets and crevices of all kinds of rock gardens. Unless otherwise

stated, the ordinary rules for the cultivation of rock garden plants apply:

Acaena (New Zealand Bur).—Useful to carpet the Alpine Lawn, all about 1 in.

A. Buchananii.—Silvery green.

A. inermis.—Bronze-grey.

Acantholimon (Prickly Thrift).—Clear rose-pink flowers. Ideal for hot sunny crevices. 4 in. June.

ACHILLEA argentea (Milfoil or Yarrow).—Silver foliage. White. 4 in. Summer.

Aethionema.—Alpine sub-shrubs with blue-grey leaves, white or pink flowers. 6 in. June.

Ajuga, reptans variegata (Bugle).—Golden carpenter. 3 in.

Allium, cyaneum.—Blue. 4-5 in. July.

Alyssum (Madwort).

A. saxatile (Gold Dust).—Golden flowers, produced in masses in May. 9 in. There is also a sulphur-yellow form and one with double flowers. Can be raised easily from seeds or by cuttings.

Anagallis (Bog Pimpernel).—Useful for sunny as well as boggy parts of the rock garden. Increase by seed sown in spring under glass. Flowers pink, white, or red.

Anchusa, myosotidiflora.—A dwarf Anchusa with forget-me-not blue flowers. Poor soil suits best. Increase from seed or by cuttings rooted in July. Plant in autumn, or on cold soils, in spring.

Androsace (Rock Jasmine).—Choice Alpines mostly more suited to the Alpine house than the open rock garden. Sun and scree, and sufficient soil moisture are required for all. The following are some of the easiest species for the amateur:

A. arachnoides.—Pink-white, 3 in. Silvery rosettes. Sandy loam in limestone.

A. carnea.—Rose and white, 3 in. Fine for the moraine.

A. foliosa (strigilosa).—5 in. Sandy loam and leaf-mould. Grey green tufts. Protect in winter.

A. lanuginosa.—Silver-grey trailer, rose-pink flowers. Well-drained loam, or in the moraine.

Anemone (Wind Flower).—*A. alpina*. White flowers. 1-2 ft. May. Fern-like leaves. Fibrous rooted. Seed sown in April.

A. persepnone.—A race of hybrids, much larger than those of *fulgens* type, colour crimson and salmon-pink to cherises and yellow.

A. pulsatilla (Pasque Flower).—Large purple blossoms silky outside, with lovely golden tassel at the heart. 9 in. April. Dry situation preferred. Tuberous. Propagate by root division September to March.

Antennaria (Cudweed).—*A. dioica hyperborea*.—A neat pretty carpenter good for paved paths. Silver foliage, pink everlasting flowers. 2 in.

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A. dioca tomentosa.—Silver carpenter, with white everlasting flowers. For paving and the Alpine meadow. 3 in. Increase by division.

Anthemis (Camomile) *Compositæ*.—*Aizoon*.—Silver carpenter, white. 3 in. Summer. Increase by seeds.

Anthyllis (*montana rubra*).—Crimson. 3 in. June. Forms a matted tuft. Increase by cuttings or division, spring or autumn.

Aquilegia (Columbine) *cærulea*.—"The Rocky Mountain Columbine." A very beautiful species, with pale lavender and white, long-spurred blossoms. 18-24 in. June. Increase by seed.

Arabis (Rock Cress).—One of the commonest of rock and edging plants.

A. albida plena.—The double form is the showiest. There are also varieties with pink ("Taplow Pink") flowers, and variegated foliage (*albida variegata*). Increase by cuttings, potted off and replanted in a shady part of the garden. Keep the plants restricted to their positions by clipping back, or they will rapidly oust the more delicate Alpines.

Arenaria (Sandwort).—*A. balearica*.—Excellent on cool northern rocks; vivid emerald foliage and white fairy flowers.

A. montana.—One of the best of all Alpines. Trailing masses of immense snow-white flowers. 6 in. June. Increase by seed or cuttings.

Armeria (Thrift).—*A. alpina*.—Choice dwarf Thrift, one of the best for rock garden. Rose-pink flowers. 2 in.

A. cephalotes, *Bee's Ruby*.—Superb giant Thrift, warm rose-pink. 12 in.

A. maritima "*Vindictive*."—The best form, flowers rich deep crimson, seldom out of flower. Invaluable for rock garden, wall gardens and edgings. 6 in.

Arnica.—*A. montana*.—Huge golden flowers on foot-high stalks in June. Requires cool peaty soil.

Artemisia (Wormwood).—*A. canescens*.—Beautiful sub-shrubs for rock garden, wall garden or border. Erect, graceful branches, which are a cloud of silver filigree foliage. 18 in.

A. lanata pedemontana.—A prostrate form. 2-3 in. Increase by divisions or cuttings.

Asperula.—*A. Gussonii nitida*.—Mossy cushions, pink flowers. 1 in. May.

A. suberosa.—A tuft of silver fluff with rosy trumpet flowers. Scree or Alpine House. Dislikes lime. 2 in. June.

Aster (Starwort).—*A. subcæruleus*.—Rich violet, orange centre. 1 ft. June. Increase by division, and protect from slugs.

Aubrietia.—Brilliant trailers for rock or wall garden and border edgings. Trim well back after flowering and insert the pieces as cuttings. Some of the best of modern hybrids are:

Carnival.—Very large solid flowers of intense, brilliant violet-purple.

Daybreak.—Delicate rosy lilac.

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Dr. Mules.—Intense deep purple.

Vindictive.—Immense blossoms of barbaric crimson.

Violet Queen.—Rich purple.

Bellis (Daisy).—The "Dresden China" variety of *Bellis perennis* is one of the best for rock gardens.

Bellium.—*minutum* (Little Mary).—Pigmy daisy. White flushed pink. 1 in. For Alpine Lawn, Sink, and Paved Walks. Summer.

Calamintha (Calamint).—*C. alpina*.—Charming Alpine of mat-like habit. Violet flowers all summer. Aromatic. 3 in.

C. grandiflora.—Larger than *alpina*. Reddish violet. 12 in. June.

Calceolaria.—*C. Darwini*.—Dwarf running habit, like *C. polyrhiza*, and very large solitary flowers carried on 3-4 in. stems. The flowers are deep gold, flushed crimson, and with a broad band of pure waxy white across the lip. Light rich soil in cool position.

C. hybrida John Innes.—Carpets of light green foliage, slender stems bearing several large golden-yellow flowers; shade, fairly moist spot; June-July. 6 in.

C. polyrhiza.—Dense carpet of light green foliage from which spring numerous branching stems bearing a profusion of golden-yellow flowers; June-July. 9 in.

C. violacea.—Rare half-hardy species, abundance of small lavender flowers. July-September. 2½ ft.

Caltha (Kingcup).—*C. palustris plena*.—Double golden bog plant. 9 in. April.

Campanula (Bell Flower).—The best for rock gardens.

C. Allionii.—Lilac blossoms like Canterbury Bells, on inch-high stems. May. Scree. (Several good hybrids are obtainable.)

C. barbata.—Silvery-blue bearded bells on 9 in. stalks. June-July. Difficult to rear.

C. carpatica.—Showy. Cup-shaped, violet flowers. 9 in.

C. carpatica "Isabel." Large wide-open bells. Deep violet.

C. turbinata. Very dwarf. Large solitary violet flowers.

C. excisa.—An extremely attractive plant of graceful habit. Nodding violet bells. 4 in. June. Difficult to rear.

C. Portenschlagiana (muralis).—Superb trailer for rock garden or edging. Solid sheet of rich violet bells. Summer. 6 in.

C. pulla.—Hanging bells of deepest glossy purple. 3 in. July.

C. pulla lilacina.—Distinct and very pretty lilac form.

C. pusilla.—Charming lavender-blue dwarf Harebell. 3 in. June.

C. pusilla alba.—White.

C. pusilla "Baby Bell."—A most charming and delightful form, with dainty little round bells of deep lavender. 3 in. June.

C. pusilla lilacina.—Delicate lilac with a pink flush.

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C. pusilla Miss Willmott. Bells of soft luminous lavender blue. Free flowering. 4 in.

C. speciosa.—Glorious spikes of unusually large wide open bells 2 in. across. Soft luminous lavender blue. 18–24 in.

C. Tommasiniana.—Long lilac bells. 6 in. July.

C. Warleyensis.—Trailing hybrid, double lavender bells. 3 in. August.

C. Zoysii.—Lime scree. Curious lavender bells crumpled together at the mouth. 2 in. August. Difficult to rear.

The cultivation of Campanulas in the rock garden is very simple. For the most part this genus revels in ordinary sandy compost with plenty of grit and leaf-mould. Lime is distasteful to most, though some are indifferent. *C. pulla* is best in the moraine, or in a pocket where a peaty sandy loam is present.

Almost all Campanulas are best increased by division. Seeds germinate freely but do not come true to type, though interesting and satisfactory plants are raised by this method. They should be sown in pans as soon as they are ripe, or in spring, and pricked out as necessary.

Cardamine (Lady's Smock).—The best variety is the double-flowered lilac *C. pratensis* fl. pl. It is increased by division in March.

Carlina (Dwarf Thistle).—*C. acaulis* is a pretty rosette plant, easily raised by seed sown in spring or autumn. The miniature thistle flowers nestle snugly in the centre of the rosette.

Celmisia.—Tufted plants with daisy-like flowers in summer. A dry warm position is best, but semi-shade will do. Increase by seed sown under glass in March, or as soon as ripe. Give slight winter protection. All the hardy species grown in the rock garden grow about 12–18 in. high.

Cerastium (Mouse Ear, Chickweed, Snow in Summer).—*C. Biebersteinii*.—White flowered with silver foliage, is the best species to grow. It can be increased readily from seeds or cuttings. In fact, the trouble with *Cerastium* is not how to make it grow, but how to restrict it to reasonable proportions! It pays to cut it back drastically from time to time. June–August. 6 in.

Cerastostigma (Leadwort).—*C. plumbaginoides* (*Plumbago* *Lar-pentæ*).—Sky-blue flowers, red leaves. 6 in. Increase by seed or division.

Cheiranthus (Perennial Wallflower).—*C. "Harpur Crewe."*—A neat little old-world double Wallflower. Rich gold. Very fragrant. 12-in. April–May.

Chrysanthemum.—*C. alpinum*.—A rare, white, creeping Marguerite. Granite scree. 2 in. Summer.

Chrysogonum (Golden Knee).—A showy perennial, about 10 ft. high, something like a sunflower. Good for shady parts of the rock garden. Likes rich loam. Increase by seed or division in spring, or division of roots in September.

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Cistus (Rock Rose).—See *HELIANTHEMUM*.

Claytonia.—Dwarf hardy perennial plants that are quite suited to rock-garden cultivation. They are lime haters, and should be given pockets of loam and leaf-mould in sun or shade. Increase by seed in March or division in spring or autumn. Flowers are pink or white according to species.

Codonopsis.—*C. ovata*.—Creamy-blue bells beautifully marked with orange and black inside. 1-3 ft. July. Suitable for ordinary loam. Increase by seeds or division.

Convolvulus.—*C. mauritanicus*.—Delightful trailing species, with funnel-shaped flowers of a violet-blue. Summer. 1-ft. Excellent in warm sunny pockets.

Cotula.—Invaluable carpet plants for paved walks, and for the alpine meadow. 1-in. *C. barbata* can be raised from seed sown direct in the cracks.

Cotyledon (Pennywort).—*C. simplicifolia* is a quaint showy Alpine, carrying golden racemes or "Lambs' Tails" on 4-5 in. stems. June. Increase by cuttings.

Crepis (Hawkweed).—*C. aurea*.—A bright dwarf Alpine "Hawkweed," with handsome tawny orange flowers. 4-in. June. Increase by seeds or division in April.

Cyclamen.—*C. europæum*.—A dainty autumn-flowering species. Flowers rose-crimson and scented like the Lily of the Valley. 3-4 in.

C. neapolitanum.—Ivy-shaped foliage richly marbled. Bright pink flowers in Autumn. 3-in.

Both like peat, leaf-mould, and mortar rubble. Suitable for the shady side of the rock garden.

Cypripedium (Lady's Slipper).—These are hardy orchids. They make a distinctive feature in any rock garden, and are always sure to attract attention. *C. spectabile* is a useful plant for the bog or marsh garden (June-July, pink and white). *C. calceolus* (June, brown and yellow), will thrive in semi-shade if grown in leaf-mould and lime chips.

Cytisus (Broom).—The prostrate shrubs belonging to this genus are excellent on the rock garden. They include:

C. ardoini, June, 9-in., yellow.

C. kewensis, May-June, cream.

C. purpureus, May-June, rose-purple.

Plant in October, and keep the plants clipped back regularly, but do not cut back into old wood.

Increase by layering in October.

Daphne.—The Daphnes are dwarf shrubs, some of them very suitable for rock gardens. Their flowers are waxy and fragrant, and the berries are often very decorative.

Ordinary garden loam is generally suitable.

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D. cneorum, purple-pink (The Garland Flower), is one of the most fragrant. 1-ft.

D. mezereum, purple-rose, March, is also suitable for parts of the rock garden, and can be raised from seed. 3-ft.

D. petraea is a very dwarf species, but only suited to culture in the Alpine House.

Dianthus (Pinks).—An almost unlimited number of hardy pinks are available for rock-garden culture. Apart from *D. glacialis* and *D. neglectus*, they all like an open soil with some lime. These two lime-haters are best in the moraine. The biennial *D. chinensis* (Indian Pink), is best raised from seed one season, wintered in a cold frame, and planted out in early spring. The others can be increased by seeds or cuttings.

The following is a list of the most suitable species for the amateur's rock garden:

D. alpinus.—Attractive species for scree. Large, round solitary pink flowers on 1-in. stalks. 2-in. May.

D. cæsius.—The Cheddar Pink. Blue-grey mats, rose-pink flowers. 4-in. June. Fragrant.

D. deltoides (Maiden Pink).—Rose. 4-in. June.

D. Donnezetti.—A delightful hybrid, which flowers profusely during the summer. Large crimson blossoms with dark central zone. Excellent for crevices or hanging positions. 9-in.

F. Millard.—Large double flowers of a dull crimson shade. Neat habit. Suitable for the rock garden or border. 9-in. June.

D. La Bourbille. Neat tufted habit. Grey leaves and bright pink flowers in summer. 3-in.

D. neglectus.—Bright pink flowers with buff reverse. 3-in. June.

D. Ruth Fischer. A charming old plant. Solid double white flowers of exquisite form. Good, also, for the front of the border. 9-in. June.

D. squarrosus.—Tufted habit, white fringed flowers. Fragrant. 3-in. June.

Dicentra (Dutchman's Breeches).

D. formosa.—Fern-like foliage, arched stems, pink flowers. Good in town gardens. 9-in. April.

Dodecatheon (American Cowslip).—Umbels of cyclamen-like flowers held above clusters of thick leathery leaves. Likes a deep rich loam with no lime. Increase by seed under glass in March, or in the open garden later, or by division of roots in spring or autumn. Flowers lilac-rose or white according to species. May to July.

Douglasia.—*D. laevigata*.—Close mat-like habit, large rose flowers. Enjoys a cool aspect. 1-in.

D. vitaliana.—Compact silvery mats. Golden flowers. $\frac{1}{2}$ -in.

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Draba (Whitlow Grass).

D. pyrenaica (*Petrocallis*).—Lilac, scented. Scree. $\frac{1}{2}$ -in. May.

Drosera (Sundews).—Insect-eating plants. Best in Alpine House.

Dryas (Mountain Avens).—Increase by seed, under glass.

D. octopetala.—Large anemone-like flowers, golden centres. 3-in.

The seeds are ornamental and dead flowers should be allowed to remain.

Erica.—(Heather).—Dwarf species are often grown as edgings to the paths through the rock garden, and heather gardens, consisting in the main of plantings of various hybrids of fine colouring, are also becoming popular. Some of the best *Ericas* for the amateur's small rockery are:—

E. carnea.—Crimson and white, winter-flowering. 1-ft.

E. cinerea.—Bell heather, purple. Sept. 9-in.

E. mediterranea.—Lilac rose. May. 2-19 ft.

E. textralix.—Cross-leaved Heath. May-June. Pink. 1-ft.

A soil free from lime is needed by most heathers, though *E. carnea* will grow in ordinary limed garden soil.

Increase by cuttings of fresh growths, or pieces pulled off with a heel, inserted in sandy peat. No pruning is needed except to remove dead flowers.

Erinus (Summer Starwort).—Hardy evergreen, for crevices in paving, or old walls, or for spaces between large rocks. Sandy loam and mortar rubble are desirable.

E. alpinus has lilac-white flowers in great profusion. Increase by seed in spring, or by division in autumn.

Eriogonum.

E. sub-alpinum major.—A choice North American trailer with dark leathery leaves and heads of pale yellow, reddish budded flowers on red stems. 4-in. Increase by root division.

Eritrichium.—One of the tests of an alpine gardener's skill. The plants are difficult to rear, even in the Alpine House, and are almost impossible to rear in England in the open. *E. nanum* has dazzling blue flowers with yellow centres, and woolly silver leaves. 2-in. May.

Erodium (Heron's Bill).

E. hybridum roseum.—Compact habit. Studded with large soft rose flowers the whole summer. $\frac{1}{2}$ -in.

E. macradenum.—Large pink flowers, with black blotches on lower petals. 6-in. Summer.

Erpetion.

E. reniforme.—A most delightful carpeter, with dainty violet and white flowers on slender stems. 2-in. May.

Euonymus.

E. radicans kewensis.—A delightful little trailing or climbing evergreen shrub for the rock garden.

ROCK GARDENS

Ferns. See CHAPTER VI.

Festuca (Fescue Grass).

F. glauca. Effective shock-headed tufts of blue-grey. 6 in., and its variety "*pumila*," a minute tuft of grey, grassy foliage, ideal for miniature gardens. 2 in.

Frankenia (Sea Heath).

F. laevis. Useful carpeter, heath-like mats with tiny, lilac flowers. 1 in. July. Excellent for paved walks. Prefers gritty loam and peat.

Gaultheria (Partridge Berry).

G. procumbens. Miniature shrub. White blossoms. Scarlet berries. 6 in. May. Sandy peat with no lime is preferred.

Genista (Gorse).—The Spanish Broom, *G. hispanica*, is ideal for a dry sunny bank in the amateur's rock garden. It flowers in May and June, with profuse golden flowers over a bush anything up to 3 ft. in height. Another species useful is the double-flowered Gorse *G. tinctoria fl. pl.*, which is even dwarfer.

Both are best as a background to the rock garden.

Gentiana (Gentians).—Though gentians are perhaps the best loved of all rock flowers, it comes as a surprise to many amateur gardeners to learn that there are well over a dozen varieties *commonly* grown in British rock gardens. But gentians are inclined to be particular in their demands—almost temperamental! When they rebel against soil or situation they are often a complete failure.

G. acaulis is the best known of the gentians. This species is also one of the easiest to grow, though it does not always bloom well. One hardly expects to be told to "heave a brick at it," but plenty of brick rubble in the soil is beneficial. Some growers actually pass a garden roller over the plants in autumn, asserting that the rough treatment induces more flowers the next spring! *G. acaulis* has huge blue trumpet flowers, and as it is only 3 in. in height, a mass of bloom makes a carpet of intense blue. There is also a white variety. A rich stiff loam seems the most agreeable soil for this species.

G. sino-ornata, next in popularity, has proved to be an excellent dwarf bedding subject. It flowers from September onwards, when blue flowers are specially valuable. It requires nothing more than a good bed of leaf-mould and will flourish in semi-shade.

Other favourite species include *G. Farreri*, which has trumpets of light Cambridge blue, and a hybrid *G. Wellsii* (*G. Macaulaysii*, var. *Wells*), which is stronger growing than *Farreri*, and has flowers midway between those of *sino-ornata* and *Farreri* in colour.

G. verna, the lovely Star Gentian of the Alpine meadows, is reputed to be difficult to grow. It only needs moist, well-drained soil, and i

strong pot plants are obtained, and set out in such a soil, they seldom fail.

It is undoubtedly the soil preparation, more than any other factor, which makes for success with *Gentians*. Moisture, plentiful but not stagnant, and a cool root run with a reasonable amount of sunshine are the main requirements. The subsoil should be rough, and either very deeply dug or left moist by the passage of running water, as in an artificial moraine. Both heavy and light soils should receive an extra dressing of leaves and broken brick, and occasional top dressings of stone chips.

Geranium (Cranesbill).—Some of the best are:

G. Endressi, bright rose, June. 9 in.

G. grandiflorum, violet blue, 12 in. Summer.

G. macrorrhizum, crimson, fragrant leaves, 9 in. Summer.

They are easily increased by seed sown in spring or summer, or by cuttings, or division.

Geum (Avens).—*G. Borisii*, dwarf flowers, orange scarlet, continuous all summer, 9 in.

Gypsophila.—*G. repens* is a rockery species which has white flowers, in June. It is quite dwarf, only about 3 in. high.

Haberlea.—*H. rhodopensis* has mauve flowers rather like a *Ramondia*, 3 in. Good in shade. Increase by seeds or division.

Helianthemum (Rock Roses).—These are dwarf, evergreen shrubs, often smothered with the most vivid flowers, like large brilliant single roses. They must be grown in full sunshine, but will succeed in any soil. Some of the showiest are the named varieties of *H. vulgare*, but many other species and hybrids are offered in catalogues. The following can be recommended:

ATTRACTION.—Orange, with blood red centre.

FIRE FLAME.—Carmine-orange.

MISS LAKE.—Lemon yellow.

SNOW QUEEN.—White.

SUDBURY GEM.—Rose pink.

Helichrysum.—*H. bellidioides* is a pretty, white-flowered creeping plant, flowering in June and July.

Helxine.—A charming creeping plant with bright green foliage, and tiny, inconspicuous flowers. In sheltered moist parts of the rock garden it may easily become a pest! This is the rock smotherer which grows wild in many places in Cornwall and Devon. Pieces broken off anywhere and planted in congenial soil will root readily.

Herniaria.—Green creeping plants which, like *Helxine*, are excellent subjects for the paved garden, but these like a sunny position. Increase by root division, in spring.

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Heuchera (Alum Root, or Fairy Flowers).—Several fine hybrids are obtainable, all suitable for the rock garden, or for the edgings of borders, and all equally useful for cutting.

One of the best is the Edge Hill hybrid, with flowers a pretty shade of rose.

Increase by seeds in April or by root division in spring or autumn.

Hutchinsia.—*H. alpina* is a dwarf plant with evergreen fern-like foliage, and dainty white flowers, 3 in. May.

Increase by seed or root division.

Iberis.—*I. sempervirens* is well known as the white-flowered evergreen Candytuft. It flowers in May and June, and will grow in crevices or walls, or any rockery pocket.

Iris. See CHAPTER VI.

Leontopodium (Edelweiss).—The famous Swiss flower with woolly leaves and white, daisy-like blooms. Can be raised easily from seed, which is the best way, as plants do not like the fogs of British winters.

Linaria (Toadflax).—*L. vulgaris*, the common Toadflax, is a native of Britain. *L. alpina*, with glaucous leaves and flowers of violet and orange, and *L. cymbalaria alba*, the white Kenilworth Ivy, are both worth growing.

Increase by seed or division.

Linum (Flax).—*L. narbonense* is one of the finest forms, with rich blue flowers. 1 ft. Summer.

Increase by seeds or by cuttings in July.

Lithospermum (Gromwell).—The "Heavenly Blue" variety is well known. Flowers gentian blue, trailer. Increase by seeds, cuttings, layers, or division.

Lychnis (Catchfly).—*L. alpina* is a tiny 3 in. form with crowded spikes of rose crimson flowers.

Increase by seed sown as soon as ripe or in March.

Lysimachia (Creeping Jenny).—*L. nummularia* is one of the kindest rock-garden plants to the town gardener, as it will grow anywhere, in sun or shade, smoke or clean, country air.

Increase by division.

Meconopsis.—*M. cambrica*, an orange-flowered poppy, is fine for the wall garden or the ordinary rockery. Increase by seed.

Mentha (Mint).—*Mentha requienii* is one of the best, with lilac flowers, and dark green foliage scented like peppermint. It is ideal for the paved walk.

Morisia (Mediterranean Cress).—*M. hypogea* is a charming little plant, only 2 or 3 in. high, which succeeds well in any gritty loam, and will also grow on walls, and in paved walks, or in the Alpine House.

Increase by cuttings or seeds.

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Myosotis.—*M. rupicola*, the 3 in. Alpine Forget-me-not is fine for the moraine. Increase by seed or division.

Nierembergia (Cup Flower).—*N. rivularis*, 2 in. high, bears large white cup-shaped flowers. July.

Excellent for the Alpine House as well as for the rocky ledges.

ALPINES



GENTIANA SEPTEMFIDA



OXALIS ADENOPHYLLA



PORTULACA

Dwarf alpine appreciate a dressing of granite chippings over the surface soil in winter

Oenothera (Evening Primroses).—Some of the dwarf Evening Primroses are good for the rock garden. *O. missouriensis*, yellow, and *O. mexicana*, rose, are two of the best. Increase by seeds.

Omphalodes (Navelwort).—*O. verna* is the best-known rock species. It is sometimes called "Blue-eyed Mary" because of its lovely blue spring flowers. 4 in. Increase by seed or root division.

Orchids (Hardy).—Many of the hardy orchids, of which there are far more than the average gardener would think, are suitable subjects for rock garden cultivation. Some are best grown in the Alpine House, but for the most part those described in the following brief list can be grown in the open garden all the year round. As a rule the best planting time is autumn.

BLETIA HYACINTHINA.—An April flowering species, easily grown in partial shade situation in loam and leaf-mould. Can remain undisturbed for many years, crimson-purple.

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CALOPOGON PULCHELLUS (Grass Pink Orchis).—Long grass-like foliage, graceful sprays of large flowers, sepals and petals of a beautiful pinkish purple, lip spreading and fringed, bearded white, yellow and purple hairs. June and July. 1 ft.

CALYPSO BOREALIS.—Needs moist well-drained leaf-mould or peat; soft rose-coloured flowers with a conspicuous brown blotch.

CYPRIPEDIUM ACAULE (Stemless Lady's Slipper).—One of the most beautiful, sepals and petals purple, labellum much inflated, pale rose.

CYPRIPEDIUM CALCEOLUS (Lady's Slipper).—A charming native species; very gritty fibrous limestone in partially shaded positions; reddish-brown petals and sepals and a yellow pouch. May-June.

CYPRIPEDIUM SPECTABILE (Lady's Slipper).—The most lovely of all the hardy Orchids and equal in beauty to many of the tropical species, leaves large, sepals and petals almost pure white, lip much inflated, bright rose to crimson, easily grown in sphagnum moss, decayed leaf-mould or peat.

HABENARIA BIFOLIA (Butterfly Orchid).—Large loose spikes of sweetly-scented white flowers, slightly tinged green. Plant in a moist heavy loam, full sun.

LISTERA OVATA (Tway Blades).—One of the most distinct native Orchids, 12-15 in., slender spikes of small green flowers. Half shady position, loam and leaf-mould.

OPHRYS, the "insect" group prefer a rich heavy soil and full sun in loam and chalk.

OPHRYS APIFERA (Bee Orchid).—One of the finest of this genus, slender stems bearing several loosely arranged flowers, soft rose, with a conspicuous dark velvety brown hairy lip, lined and spotted yellow. June-July.

ORCHIS MACULATA (Spotted Orchis).—Broad green foliage, conspicuously spotted purple, slender stems terminating with crowded spikes of rosy-purple flowers, curiously lined and spotted; June-July. Grows in loam and chalk.

ORCHIS MASCULA (Early purple Orchis).—One of the most ornamental native species, broad pale green foliage, crowded spikes of rich purple flowers.

SERAPIAS CORDIGERA.—European species, growing about 1 ft. high, conspicuous lilac-coloured flowers with pendant purple lip; partial shade, loam and leaf-mould.

Oxalis (Wood Sorrel).—*O. rosea* is a charming sorrel with rose flowers in summer. Increase by root division.

Papaver.—*P. alpinum*, a biennial, and *P. nudicaule*, the Iceland Poppy, best treated as a biennial in cold gardens, are both excellent in rock gardens.

Increase preferably by seeds.

Phlox.—Dwarf rock varieties of phlox include the following, most of which can be increased easily by root division or by cuttings:

AMOENA.—Large deep rose. 6 in. May.

DIVARICATA.—Heads of lavender-blue flowers. 6 in. May.

DOUGLASII.—Mat-like habit. Lavender-blue. 1 in. May.

STELLARIA "G. F. WILSON."—One of the most useful and beautiful of all mossy Phloxes. Lavender-blue.

SUBULATA "MOERHEIMI."—Deep rose-pink.

SUBULATA "VIVID."—Warm salmon-rose.

Primulas. See CHAPTER VI.

Ramondia (Pyrenean Primrose).—One of the finest of rock plants for the very shady slopes. Soft violet flowers rising from a rosette of green leaves. 3 in. May.

Increase by seed sown as soon as ripe, or in March, or by root division in April.

Ranunculus.—Herbaceous or tuberous rooted "buttercups" of white or gold, mostly flowering in early summer.

Plant the tuberous species claws downwards, 2-3 in. deep and 6 in. apart, in March, in a sandy pocket. Lift after flowering.

Increase perennial herbaceous species by root division in November or April.

Raoulia.—*R. australis* is a tiny carpet plant like frosted silver, fine for the paved walk.

R. glabra is good for the alpine lawn.

Increase by seed or root division.

Rhododendron. See CHAPTER VI.

Rosa.—*R. Rouletti* is the Fairy Rose, a tiny miniature of the old Monthly Rose. It flowers continuously all summer. 5-6 in.

Rubus (Bramble).—*R. arcticus* is a dwarf bramble, only 3 in. high, and extremely interesting. Increase by suckers.

Saponaria (Rock Soapwort).—*S. ocymoides*, a trailing plant that makes a sheet of pink over the rockery pockets in May.

Increase by seed in spring or division in spring or autumn.

Saxifraga (Saxifrages).—Perhaps the most generally accepted of rock plants. Known to every amateur rock gardener. They are divided into different sections, according to their habit of growth.

AIZOON OR ENCRUSTED SECTION.—These take the form of silvery-grey rosettes, with leaves encrusted with white. Flowers are carried in graceful sprays, in May or June. Will grow in any ordinary rock-garden soil.

S. aizoon and its varieties with yellow or rose flowers best known of the section. 6-10 in.

S. longifolia and its varieties send out sprays of flowers sometimes over 2 ft. in length.

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S. cotyledon is also a magnificent plant, with 2 ft. flower sprays.

KABSCHIA or **CUSHION SAXIFRAGES**.—These like scree, and are all miniature forms. *S. Burseriana* and its varieties with white or sulphur flowers, and red stems, is one of the best-known species.

PORPHYRION SECTION.—These are prostrate and bear stemless flowers.

S. oppositifolia and its hybrids are best known. They form a snowy or pink carpet in March.

MOSSY SECTION.—This section will grow in partial shade, and for the most part need no special care. They flower profusely in spring, and grow rapidly, so that they can easily be increased by pulling off pieces and inserting them as cuttings.

Numerous other Saxifrages are listed in the catalogues of rock garden specialists, some suited for cultivation in the Alpine House, but almost all capable of being grown in the open.

Scutellaria (Skull Caps).—Useful plants for poor dry soil, pink or purple, August. 6 in. Increase by seed or division.

Sedum (Stonecrop).—The common stonecrop is so well known that it scarcely needs description. There are many other desirable forms, some with purplish foliage, some gold, some with white flowers and some with pink or gold. The best of all is *S. spathulifolium purpureum*, a variety with purple foliage; but a collection of mixed Sedums is better than too much of any one kind.

Sempervivum (Houseleek).—*S. arachnoideum* is the Cobweb Houseleek, and the best known. It can be increased easily by division, and grows anywhere.

Silene (Catchfly).—Dwarf species are excellent for paved walks or walls, or for pockets in the rock garden. They like sun and an open position in moist, gritty loam.

S. Hookeri, a good subject for scree, is one of the best.

S. Schafta, which has rosy magenta flowers in late summer, is very useful for this season in the rock garden.

Sisyrinchium.—Small iris or gladiola-like plants, excellent for cultivation in warm sandy pockets. Increase by division, but lift as seldom as possible.

Flowers are blue, violet, white or yellow, according to species.

Soldanella ("Lady of the Snows").—*S. alpina*, and *S. montana* are the best known. Lilac or purple bells, on 3-4 in. stems. March.

Increase by seeds sown as soon as ripe, or by division.

Protect in winter with a pane of glass.

Thymus (Thyme).—*T. citriodorus*, the lemon-scented thyme, is one of the best known. Varieties are obtainable with silver or gold foliage.

Several other species and varieties are listed in catalogues.

Increase by seed or division.

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Veronica.—Several species of Veronica, some dwarf and erect, others trailing, are grown on rock gardens. *V. spicata* "Royal Blue" is one of the showiest, 9 in.

V. teucrium dubia, which is a trailing species with sheets of blue flowers, is also showy.

Increase by cuttings, pinched back a little at first to make them showier.

Viola.—*V. gracilis* and its hybrids are well known as showy rock plants.

Increase by seeds in June, or by cuttings from April to October.

Zauschneria (Californian Fuchsia).—*Z. californica mexicana* is a scarlet, autumn-flowered rock plant suitable for paved walks in full sunshine. Increase by divisions or cuttings in early spring.

THE ROCK GARDEN

Rock garden planting gives an opportunity for creating real pictures. It is not enough to know how to grow each of the rock plants. The rock gardener must also know how to make use of the various types of plants for picturesque effects.

In considering this it is as well to keep in mind the various types which are available, each of which serves a distinct purpose. There are, for instance, the carpet plants such as Arabis and Aubrietia for covering sunny pockets, and Arenaria and Helxine for smothering pockets and rocks on the shady slopes.

There are some plants with rosettes, spread out like little green carpets beneath the dancing fairy flowers. To this group belong the Ramondias, Primulas, and a number of the Saxifrages. Then there are plants with sword-like or grassy leaves that rise vertically from the pockets, thus giving added line and form to the rock garden when used as a break between the smoother growth of creeping carpets. In this group are the Alpine Irises and Sisyrinchium, the hoop-petticoat Daffodil and the autumn-flowering Caffre Lily.

Then there are dwarf pyramid shrubs, which give the effect of real mountain scenery if they are planted half-way up the slopes of the rock garden. *Cupressus obtusa* is one.

There are also dwarf spreading conifers such as *Juniperus communis nana*, and berry-bearing shrubs such as the low spreading *Cotoneaster horizontalis*.

Colour in the rock garden is also important, particularly at seasons when most rock flowers are at rest, and such colour can best be introduced by using gold-leaved shrubs like *Taxus baccata adpressa aurea*, or blue-green shrubs such as the weeping *Picea pungens glauca-pendula*. Grey-leaved shrubs such as the alpine Artemisia, dwarf Lavender and Santolina are also good for creating contrasts in the rock garden.

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Lists of plants for such special purposes in the rock garden are given here, so that the amateur can make his own selection:

Rock Plants for Sunny sites

Achillea (Milfoil)	Ice Plant (Mesembryanthemum
Allium	crystallinum)
Alyssum (Rock Madwort)	Iris (various)
Anagallis (Pimpernel)	Papaver alpinum and P. nudicaule
Anchusa (Alkanet)	(Poppy)
Antirrhinum (Snapdragon)	Pinks (Dianthus)
Brachycome (Swan River Daisy)	Rosmarinus officinalis (Rosemary)
Calluna (Ling Heather)	Saponaria (Soapwort)
Campanula (Bellflower)	Saxifraga (most varieties)
Edelweiss	Statice (Sea Lavender)
Erysimum (Fairy Wallflower)	Thalictrum (Meadow Rue)
Forget-me-not (Myosotis)	Wahlenbergia (Tufted Harebell)
Heuchera (Alum Root)	Zauschneria (Californian Fuchsia)

Rock Plants for Shady sites

Auriculas (Alpine)	Ferns (hardy)
Crocus	Lily of the Valley
Cyclamen	Primula (various)
Daffodils	Ramondia
Dog's Tooth Violet	Snowdrops
Eranthis (Winter Aconite)	Violas

Spring Flowers in the Rock Garden

Anemone apennina	Narcissus (various)
Chionodoxa	Phlox (dwarf alpine)
Cyclamen (some varieties)	Saponaria
Gentiana (various)	Saxifraga (various)
Muscari	Scilla

Summer Flowers in the Rock Garden

Achillea argentea (Milfoil)	Cheiranthus
Anthyllis	Dianthus (Pinks)
Arenaria (Sandwort)	Dicentra formosa
Aster alpinus	Dryas octopetala, etc.
Aubrietia	Erinus alpinus
Campanulas	Gypsophila repens
Cerastium	Helichrysum bellidioides

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Autumn Flowers in the Rock Garden

Ceratostigma plumbaginoides	Saxifraga (various)
Leontopodium alpinum (Edelweiss)	Sedum (Stonecrop)
Nepeta Mussinii	Silene (various)
Ramondia (Pyrenean Primrose)	

Rock Plants of Smother Growth

Alyssum saxatile	Campanulas (dwarf)
Antennaria	Dryas
Antirrhinum asarina	Gaultheria procumbens
Arabis	Helianthemum
Arenaria	Lithospermum
Aubrietia	

Rock Plants with Silver or Variegated Foliage

Achillea	Artemisia lanata
Alchemilla	Cerastium tomentosum
Alyssum argenteum	Ivy (Hedera) (some varieties)
Anthemis (Camomile)	Pinks
Arabis	Sedum glaucum

Ferns for the Shady Rock Garden

Adiantum pedatum (Hardy Maiden-hair)	Hymenophyllum tunbridgense (Filmy Fern)
Asplenium (in variety)	Polystichum (in variety)
Athyrium Filix-foemina (Lady Fern)	Scolopendrium vulgare (Hart's Tongue)
Blechnum spicant (Hard Fern)	

THE YEAR IN THE ROCK GARDEN

January

Clean up rock gardens and add fresh soil if necessary.

Remove weeds from carpets of Arenaria, Aubrietia, etc.

Sprinkle lime over the soil except where heaths and other lime-haters are to be grown.

Look carefully to see if rock plants have been lifted from the soil by frosts, or if the surface soil has been washed away from the crowns. Where necessary, top dress with gritty soil, and press back the lifted plants into the soil.

Wood ashes strewn around patches of dwarf bulbs will act as fertilizer and also add warmth.

ROCK GARDENS

February

The rock garden can be remade this month during open weather. Lift out all the plants and heel them in elsewhere while rebuilding.

Do not make any part of the rockery under the drip of trees, if this can be avoided.

Build to the desired shape with rough material first, and then commence to build stones and soil from the bottom, making the stones quite firm, and leaving large soil-pockets for the rock plants. Use plenty of lime in the soil, except in places where lime-haters are to be planted.

Top dress the soil round rock plants with granite chippings to prevent them from becoming too damp, which is a frequent cause of failure in winter months.

Slight protection should be given to rock plants which are coming into flower. Cloches are useful, but a few twigs and dried leaves over small plants will be appreciated.

March

Plant or sow Californian Poppies, Campanulas, Cotulas, Dianthus, Gentians, *Gilia diathoides* (rock pink), *Iberis*, *lithospermum*, *Saponaria*, Thymes and Veronicas.

Primulas that have been raised under glass can now be planted, but sites should be chosen according to each variety; some prefer partial shade, and some like full sun. Some must have moist conditions, and should be planted where there is running water.

Anemones are useful in the rock garden, but varieties should be chosen according to the soil. Some should be in flower now.

Search for slugs among rock plants. A zinc collar placed round each plant is recommended, and also a top dressing of stale soot, lime, sifted coal ash, or finely-broken granite as an extra precaution. Traps and applications of slug-killer can also be used.

April

Apply a top dressing of sandy soil if heavy rains have washed roots bare.

Sow a few hardy annuals of dwarf kinds where bare patches occur on a new rockery. *Nemophila*, *Limnanthes Douglasii*, Candytuft, Alyssum, and *Portulaca* clothe the rock garden the first year after its construction, very quickly and effectively.

Warm, showery days invite slugs to the rockery, and tender plants are soon destroyed or damaged. After dark or early in the morning search for the invaders and destroy them.

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Excellent traps are half oranges, from which the juice has been squeezed.

Make miniature rock gardens now. In the smallest gardens a charming piece of mountain scenery can be made in an earthenware trough. For ease in tending, raise the trough to table height on some kind of support. See that drainage is provided.

Old sinks make good trough gardens, and have, of course, an outlet for surplus water.

Put rough material such as mortar rubble, old broken bricks, broken crocks, or large stones at the bottom of the trough to assist drainage. Cover this with leaves, coarse manure, or some other material to prevent the soil from washing down through the stones and clogging the drainage holes. Add more soil in which plenty of lime and sharp sand are present. and build the miniature landscape with stones and this fine soil.

May

Dead flowers should be cut away, unless seed is wanted. Any decaying leaves should be removed.

Some rock plants bear ornamental fruits. The dead flowers in such cases must be left to develop.

Primulas may need water this month if the weather is dry, and similar water-loving plants, save seeds from choice plants as many rock plants can be raised successfully this way. Sow immediately the seed is ripe, in pans of gritty soil, covering with the finest possible layer of sand.

Rock plants can be raised easily from seed sown now. Sow Alyssum, (yellow) Arabis, Aubrietia, Campanulas (various), Cerastium, Cheiranthus, Cotulas, Primulas and Silene.

June

Seeds of Pinks can be sown this month in boxes of sandy soil in the cold frame. Cuttings of short side-shoots can also be inserted under glass.

Rockery Pinks suitable for increase by seeds or cuttings during June are: *D. deltoides*, *D. chinensis*, *D. cæsius*, *D. hedderwigii*.

In new gardens, where large spaces on the rockery have to be filled, increase your carpet plants this month.

Arabis, Aubrietia and the Mossy Saxifrages all increase easily by means of cuttings. Shoots two or three inches long make good cuttings. Insert in sandy soil under a hand light, or in a frame or in any place where they can be kept moist and shaded.

July

Take more cuttings of rock plants. As soon as the cuttings are rooted, transplant them into the pockets in the rock garden.

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Where colour is desired, *Viola cornuta* is very useful in the new rock garden. Seeds sown now on any free patches in the rockery will make a mass of bloom next summer. Sow thinly in pockets of sandy loam.

Young plants of Iceland Poppies seldom get killed off by frost, if seed is sown this month. They are fine for rock gardens, and thrive as real perennials in pockets of warm, sandy loam.

August

New rock gardens can be made now.

Wait for a showery day, and lift out the plants with as much soil as possible attached. Replant each temporarily in one of the borders, then remake at your leisure.

Take out all large stones, dig over the soil and, if needed, improve the drainage by adding large bricks and other rough material to the inside portion.

Begin to rebuild from the bottom, slope the rocks inward, fill the pockets with light soil well mixed with sand. Add lime where lime-loving plants are to be grown.

Reset the plants *as you rebuild*, pressing each firmly into place.

September

Dwarf evergreens can be planted now; these add distinction to the rock garden. Pyramid Cupressus and spreading Junipers, in gold and blue forms, are available and most effective in winter.

Alpines should be lifted and divided. The soil of the pockets can be lightly forked, and an additional top dressing of gritty material given round established plants.

Introduce colour: Pink, red and white, *Dianthus cæsius* (the Cheddar Pink), *Dianthus alpinus*, *Helianthemum* "Sudbury Gem," *Lychnis alpina*, *Phlox amæna*, and double *Arabis*; yellow, blue and purple, "Gold Dust" *Alyssum*, *Cheiranthus*, *Viola gracilis*, *Aubrietia* "Dr. Mules," *Gentiana Lagodechiana*, *Veronica spicata* "Royal Blue," *Lithospermum* "Heavenly Blue," and *Campanula pusilla*.

The following bulbs are specially suited for rock gardens; planted now in small groups: *Anemone*, *Crocus*, *Chionodoxa sardensis*, *Erythronium denscanis*, *Fritillaria meleagris*, *Muscari* Heavenly Blue, *Scilla bifolia*, *Winter Aconites*, *Narcissus bulbocodium citrinus*, *Narcissus cyclamineus*, *Narcissus minimus*, *Narcissus triandrus albus*, *Tulipa clusiana*, *Tulipa Greigii*, *Tulipa Kaufmanniana*.

October

This is a good month to clean up the rock garden. Go over each pocket and remove decayed leaves. Stir the soil surface between the plants and

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add a top dressing of fresh soil where needed. Plants that are overgrown should be lifted and divided. Replant the best pieces and discard the rest.

Top dress the surface of the soil round Alpines with stone chippings, or if these are unobtainable use sharp sand.

Put slug traps every few yards to protect the plants, and to prevent slugs becoming numerous. Shelter woolly-leaved plants by placing a small piece of glass over them, supported by wires or sticks. The rare alpines should be sheltered with cloches.

Plant small bulbs *in drifts* where colour will be lacking in the spring garden. Those best suited to this purpose are Muscari, Crocus, Snow-drop, Narcissus, Chionodoxas and Scillas.

November

Disturb rock plants as little as possible this month.

Renew top dressings of stone chips, pebbles, or sand, if they are washed well by rain.

Keep an eye for slugs; especially round the crowns of tender plants.

Finely-sifted coal ashes piled up in little heaps over the tender crowns will protect from frost and slugs.

Occasionally go over the rock garden, removing dead leaves. Otherwise these cause rare Alpines to damp off.

December

Examine all protected plants, and wipe surplus moisture off the glass of cloches.

Rock plants lifted out of the soil by frosts should be pressed back. Put a layer of stone chippings on the surface round the plants.

If the weather is mild keep a look out for slugs. They will make for the tender plants. Zinc collars, slug traps and crystals of copper sulphate are useful in dealing with these pests.

Horizontal sheets of glass raised a few inches above the plants will protect woolly-leaved plants.

THE ALPINE HOUSE

As already suggested, a number of choice Alpines can only be grown in the shelter of a special greenhouse.

This is not because they will not stand the cold of our climate, as in most cases they are well used to frost and snow in their native habitat. The difficulty is that our climate here is moister overhead, and rains and fogs are apt to cause "damping off."

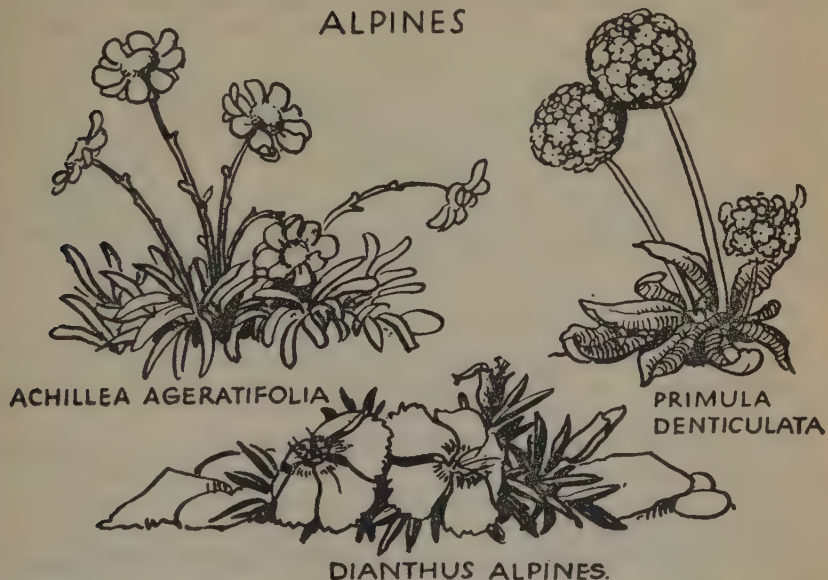
The Alpine House is frequently used just for the shelter of the plants while they are in bloom, or during the winter months when the weather

ROCK GARDENS

is most troublesome. A cold frame should be used in conjunction with the Alpine House for gradual hardening or shelter during a rest period, etc.

It is usual to grow the plants in pans, which during favourable summer weather are sunk outdoors in cold frames, or in the open garden. Usually these pans are sunk in ashes to their rims, partly because the ashes main-

ALPINES



These well-known Alpines are quite easy to grow and make effective patches of colour on the rock garden

tain a uniform temperature and moistness, and partly because they prevent slugs from gaining access to the plants.

The Alpine House does not need artificial heat, but if slight heat is available, it may sometimes be acceptable in order to create a dryer atmosphere. The house must be amply ventilated above.

Top ventilation is more important than side ventilation in an Alpine House. It is also important to provide some means of shading, which is usually required for some plants during the summer months.

The pans used for Alpine plants vary according to type, but the general size is a pan from 6-9 in. in diameter, and 4 or 5 in. deep, made of the same material as flower-pots and obtained from any sundriesman. From 1-3 in. of broken crocks should go into the bottoms of the pans in order to ensure ample drainage.

In the case of Androsace, for instance, which is a difficult genus to flower successfully in this climate, 3 in. of drainage crocks are generally used.

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Pans of tender Alpines are often stood in a tray containing water, so that the water required by the plants percolates through the soil from below. This avoids the possibility of damping the foliage, which is a frequent source of trouble.

When repotting is necessary, this is generally done about the end of the summer, and newly-potted plants are kept close in a cold frame, shaded from bright sunshine, until they have established themselves; that is, usually for about two weeks.

Alpine plants may stand in the open all summer, but, if so, they are brought under cover usually about the beginning of October. A frost-proof frame is sufficient at first, but as plants come into flower they should be removed into the Alpine House.

The general compost for use in the Alpine House is made by mixing two parts fibrous loam, one part leaf-mould, and one part gritty sand. For the lime-lovers a little broken lime rubble may be added.

PESTS AND DISEASES

Thrips, red spider, mealy bugs, scale insects and wood-lice are the common pests of the Alpine House. Slugs should not be troublesome here, although they are in the open garden.

Fumigation is the best way of treating the pests under glass, but clean culture and attention to drainage, and the mixing of a porous, gritty compost, will do more than anything else to keep down fungus diseases.

The following is a list of some of the most valuable plants for cultivation in the Alpine House. In most cases the height is only from 1-6 in.

SUITABLE PLANTS FOR THE ALPINE HOUSE

Name.	Size of Pan (Diameter).	Time to plant.	Time of flowering.	Colour.
<i>Achillea ageratifolia</i> .	5-6 in.	April	June-Sept.	White and yellow.
<i>Adonis amurensis</i> .	4-5 in.	April or Sept.	Feb.-April	Yellow.
<i>Androsace carnea</i> .	4-5 in.	Mar. or April	May-June	Rose and rose-pink.
<i>Androsace sarmentosa</i> .	4-5 in.	Mar. or April	May-June	Rose and white.
<i>Anemone blanda</i> .	5-6 in.	Autumn	Feb.-April	Dark blue, rose and white.
<i>Anemone Hepatica</i> .	5-6 in.	Oct.	February	Red; white; blue.
<i>Anemone hortensis</i> .	5-6 in.	Sept.-Mar.	Early Summer	Lilac.

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Name.	Size of Pan (Diameter).	Time to plant.	Time of flowering.	Colour.
Crassula sarcocaulis .	4-5 in.	Mar.	Summer	Red.
Cyclamen Coum. .	4-5 in.	Aug.	Jan. or Feb.	Purple-red or white.
Cyclamen ibericum .	4-5 in.	Aug.	Feb.-April	Crimson and white.
(Syn. vernum)				
Daphne rupestris .	4-5 in.	Feb.	April-May	Pink

SAXIFRAGE TYPES



The saxifragas include many different types. All can be used for rock-garden planting

Draba Aizoon .	4 in.	April	Mar.-April	Yellow
Drosera rotundifolia	4-5 in.	Sept.	June-July	White.
Dryas octopetala .	4-5 in.	Mar. or Sept.	June and July	White
Erodium chrysanthum	5-6 in.	April	June-Aug.	Yellow.
Erodium petraeum .	4-5 in.	April	June-Aug.	White.
Gentiana verna .	4-5 in.	March or April	April-May	Deep blue.
Geranium subcaulescens	4-5 in.	Mar.	June-Sept.	Rose-purple.
Hepatica triloba .	4-6 in.	April or Oct.	May and June	White.
Mertensia pulchellum	5 in.	April or Sept.	April-May	Purplish-blue.

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Name.	Size (Diameter).	Time to plant.	Time of flowering.	Colour.
Nierembergia rivularis	6-7 in.	Spring or Sept.	May-Aug.	Creamy white and purple.
Oxalis adenophylla .	4-5 in.	Mar.	May-July	Lilac-pink.
Phlox subulata .	5-6 in.	Mar. or Sept.	April-July	Rose-pink.
Phyteuma comosum .	4-5 in.	Nov. to Mar.	July	Blue.
Pinguicula vulgaris .	4-5 in.	Mar. or April	April and May	Purple-violet.
Primula capitata .	4-5 in.	Sept.	April- June	Violet-blue.
Primula denticulata .	6-7 in.	Sept.	Mar.	Lilac and white.
Primula marginata .	5-6 in.	Repot annually after flowering	Feb.-Mar.	Lavender-blue.
Ramondia pyrenaica.	4-5 in.	April	May-July	Pale purple-blue, orange centre.
Saxifraga burseriana .	4-6 in.	Spring and summer	Mar.-May	White.
Saxifraga diapensioides .	4-6 in.	Spring	April-May	White.
Saxifraga longifolia .	4-6 in.	Spring	May-June	Creamy-white.
Saxifraga oppositifolia	4-6 in.	Spring	Mar.-April	Crimson-purple.
Sedum pulchellum .	4-6 in.	Spring	Summer	Rosy-purple.
Sempervivum .	4-6 in.	Spring	June-Aug.	Reddish-pink.
arachnoideum				
Sempervivum .	5-6 in.	Spring	Summer	Pale red.
calcareum				
Silene acaulis .	4-5 in.	April	June-Aug.	Pink.
Wahlenbergia .	5-6 in.	Mar.	May-June	Violet-blue.
serpyllifolia				

Plants that must be grown without Lime

Name.	Size (Diameter).	Time to plant.	Time of flowering.	Colour.
Campanula alpina .	4 in.	Sept.-Oct.	July-Aug.	Light blue.
Campanula pulla .	4-5 in.	Mar. or Sept.	June-Sept.	Violet.
Campanula pusilla .	4-5 in.	Mar. or Sept.	June-Sept.	Blue.
Dianthus alpinus .	4-5 in.	Sept.	June	Rose.
Dianthus neglectus .	4-5 in.	Sept.	June	Rose.

CHAPTER X

WATER FEATURES—CONSTRUCTION AND PLANTING—WATER PLANTS

WATER FEATURES

FEW things are so pleasing as to listen to the soft splash of water from the fountain, or to watch the rainbow reflections of June sunshine as the drops splash into the surface of a pool. It is not known when fountains were first introduced into garden design; certainly water was used in the earliest gardens of which we have any record, so also were Water Lilies.

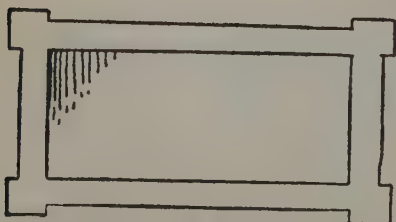
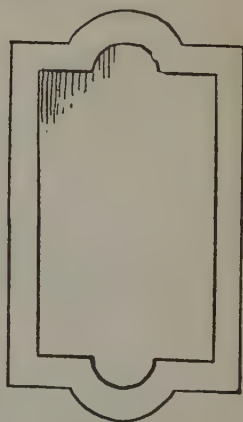
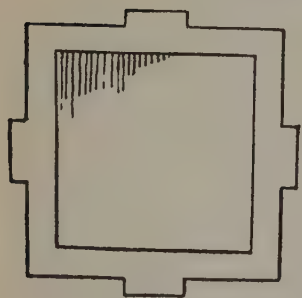
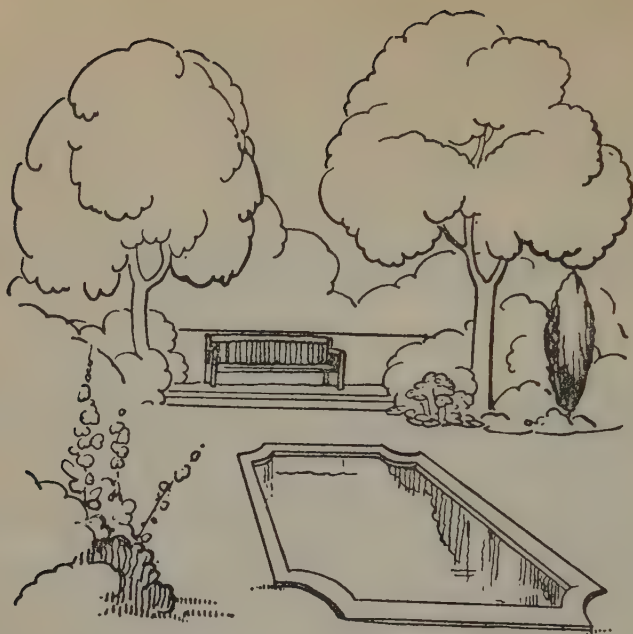
It is partly because the introduction of water into a garden allows for the cultivation of fragrant Water Lilies and other aquatic plants, that it is so popular. Even when it is not accompanied by any type of aquatic planting, water is an added interest to a plot. In the hot days of summer, merely to sit by the side of a shallow rill of clear water, is an attraction to the home garden.

At the same time the garden maker ought to remember that there are occasions when the introduction of water in a garden is a mistake. For instance, if a garden cannot receive fairly regular attention and the district is a smoky, dusty one, water can become one of the most unsightly features instead of one of the most charming. I should never advise putting still water into a town plot unless the owner is prepared to clean the pond regularly, and *once or twice daily* on occasion to clear the surface of smuts by the simple method of drawing a piece of butter muslin across it.

However, there are so many gardens where water forms a real asset in the garden scheme, that most amateur gardeners will be glad of a few hints as to the construction of pools, rills, fountains and so on.

Choosing a Site.—Water should always be in full sunshine and away from overhanging trees. This is because the full charm of water cannot be appreciated if it never reflects the sunlight. Encroaching trees make water objectionable with their leaves, unless wire netting is used to protect it in autumn. A dark, stagnant water pool is no asset to a garden.

The natural site for water is in the lowest part of a garden. In



TYPES OF FORMAL POOLS
SUITABLE FOR FORMAL
GARDENS.

*A flat stone coping adds dignity to a formal pool.
different plots*

Here are five designs suitable for

WATER FEATURES

any case it is always best viewed from above, so that garden pictures are reflected in its depths.

Design of Water Features.—A good deal depends on whether water is being used formally or informally in the garden layout. The formal use of water would include its employment in geometrically-shaped pools, swimming pools, canals, rills, fountains and the like. The informal treatment would cover streams, cascades, rock garden pools, and lakes.

Formal Treatment.—The most popular way of introducing water into a garden where no natural supply exists is the geometrically-shaped pool.

There are many designs from which to choose. These are mostly rectangular, square or circular. A simple pool in either of these shapes, with a coping flush with the surrounding grass, paving or gravel, or with a planted surround, can be made quite easily and is little trouble to maintain. Octagonal pools, or those in which the square and circle are combined, are a little more decorative, and very charming when placed in the centre of a fairly large flat area so that the full beauty of the outline can be appreciated. Such pools look best surrounded by grass, but if a more ornate treatment such as a raised coping is desired, a gravel or paved surround is quite in keeping. A good rule to keep, is to use always a centrepiece—figure or water plant—that is considerably higher than the raised coping.

Swimming Pools are really enlarged formal pools. A simple one for family use can be made in the same way as a small pool, with just a little more attention as to detail, but a full-sized pool, say 45 by 20 ft., is a job for experts.

A **formal Canal** can be pleasing when the site calls for its length to be emphasized rather than its width. Here again, such a feature is seen to best advantage when surrounded by grass or paving, and not eclipsed by conspicuous planting too near the water.

Children are passionately fond of water. A tiny rill, perhaps only a foot or so across, and a few inches deep, is ideal for paddling or sailing boats. If it is surrounded by paving there is no fear of other garden features being spoilt. An informal rill can equally well be made as a surface watercourse through the rock garden. A concrete base over which pebbles are generously scattered makes the informal rill a lovely, chattering, beauty.

If the garden contains a natural stream, all sorts of interesting water features can be evolved. The existing stream for example can be diverted and widened. It can then become a smooth water surface, viewed across an expanse of well-trimmed grass, or the banks can be battered back so as to form a moist slope for waterside plants. Alternatively, rock work could be introduced near it, and on sloping ground it could

be dammed and diverted to form a cascade tumbling over rocks into a pool below.

Before any alterations are made to the channel of a stream, a fresh channel must be cut to divert the flow of water. This is especially necessary when the stream or river flows through several properties. A temporary stoppage of water in one garden might mean a flood in the garden of the owner above you and a drought in the site below, and probably some bad language in both!

Neglected Pools.—An existing pond may present a problem to a new owner, especially if it has been neglected. If there is no bottom outlet, the pond can be emptied by means of a hose used as a siphon. This is placed right under the water until it is full. One end is then carefully moved to a drain or soak away *at a lower level than the bottom of the pond*. When the pond is empty, all refuse and rubbish can be cleared, the walls beaten and battered back into shape, and fresh water run in. Suitable planting can then be done, using Willows, Irises, Water Forget-me-nots, Primulas and ornamental-leaved plants such as Gunneras.

Informal Pools.—An informal pool, made by artificial means, needs as much care in design as any formal pool. All irregularities in outline should be beautiful, and intentional, not erratic. An arrangement of rock work, or generous planting, at the margin is usually more satisfactory than a plain grass edging. One advantage of the informal pool is that it can often be employed in an odd corner where formal lines would not be in keeping with the general design.

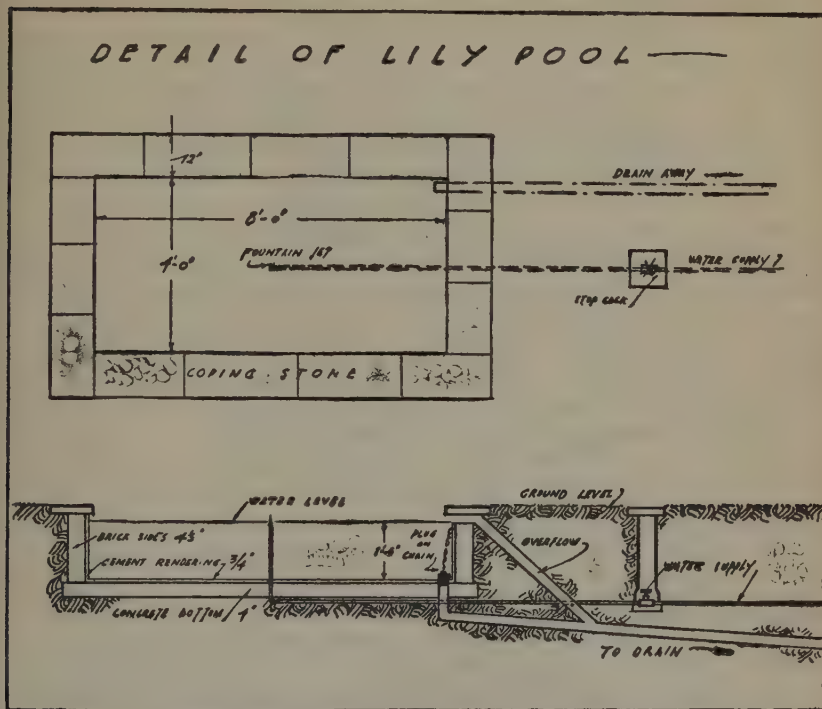
The construction of an informal pool is much the same as for an artificial pool, but when making alterations to a natural supply it must be seen that the subsoil through which the water is diverted is clay. If this is not so then either clay must be imported or artificial concrete containers made in the same way as for artificial formal pools.

Wall Fountains.—The wall fountain provides a simple way of introducing water to the garden of limited dimensions. It can equally well be employed in the larger garden. The main features are a basin from a few inches to a foot high from the ground, and some object fixed to the wall through which the water is projected. Innumerable good designs are offered by garden ornament makers. Some are ornate, others simple. The basin may be semi-circular, square or octagonal. In these very formal features artificial colouring may be introduced quite successfully. Coloured tiles or a tinted interior to the basin are charming and brighten an otherwise dull corner. In the grey town garden they make a special appeal. Formal clipped shrubs in boxes or tubs are often associated with a wall fountain, one on each side. They add a touch of green to what might otherwise be rather severe.

Jet fountains are usually associated with formal pools rather than

WATER FEATURES

informal. Perhaps the commonest design is the central, single jet. This may rise from the water surface or from an ornamental figure or sculptured design raised above the water surface in the centre or on one bank. The proportion of a fountain jet to the width of the pool is important and the installation of a fountain spray that constantly splashes over on



Here is a working drawing showing very clearly how to construct a small pool

to the pathway is a thing to be avoided. Also it is not wise to place a fountain where there is much wind, likely to carry the spray to surrounding paths or grass.

Construction.—The construction of formal water features is as follows: Dig a hole the required size and roughly the required shape. A pool 3 ft. deep should be not less than 6 ft. in diameter. For general purposes 2 ft. 6 in. is deep enough. This will be sufficient for most of the garden water plants.

Slope the walls slightly outwards at the top. This allows for the expansion of freezing water without cracking the walls. Remember to excavate sufficiently to allow for the thickness of the walls and bottom.

Ram the sides and bottom firm, especially the bottom, to form a solid foundation. The next step is to prepare concrete. Two parts of sharp sand with one of cement is a good proportion for small pools.

If the soil is fairly heavy, and makes a good natural foundation the bottom can be 4 in. and the walls 3 in. thick for a pool not exceeding 400 gallons capacity.

1 cubic ft. of space takes $6\frac{1}{4}$ gallons of water.

As the pool increases in size so the thickness of the walls should increase. Pools of more than 500 gallons capacity need a second foundation. This is made by mixing two parts sand, one part cement and four parts of broken bricks. This is used for half the thickness of the foundations, the finishing half being a mixture of equal parts of sand, Portland cement and $\frac{1}{4}$ in. chippings (granolithic).

For battered walls the concrete should be dry enough to hold together, but straight walls will need the concrete of a creamy consistency, run in between boards. The constituents of the concrete must be thoroughly mixed in the dry state first, otherwise the mixture will probably be porous. The best plan is to build the bottom and the walls at one time, and if possible complete the whole job without a break. Arrange for inlet, outlet and fountain pipes as the work proceeds.

Fish and Plants.—Plants or fish should not be put into the water directly the pool is filled. Certain harmful matters in the concrete should first be eliminated. Fill the pool with water and leave it for two or three weeks, occasionally scrubbing it out and refilling with fresh water. If delay is undesirable proprietary preparations can be bought, which will immediately neutralize any harmful matters which may be present and make the pool ready for use as soon as the concrete is dry.

Cascades in the Rock Garden.—One of the most charming ways of introducing water into a tiny home garden is by arranging for a trickling stream to follow the slope of the little rock garden. For this it is essential to have a water supply—usually it will be the company's supply—available, with a tap at the highest part of the rock garden. It is also important to have some outlet for the surplus water at the lower end of the rock garden, though this may be merely a sump, that is, a hole say 3 ft. each way dug in a convenient part of the garden. It should be roughly filled to within 6 or 9 in. of the surface with beaten cans, broken bricks, clinker or some other coarse material. Over this the surface soil can be replaced, so that the sump is invisible. Pipes will of course lead into the sump from the lowest pool of the rock garden.

An extremely simple way of taking the water down the rockery slope is to make a series of small shallow pools, each of which overflows in the form of a cascade into the pool below. This is much more simple than it sounds, and extremely effective when well done. The usual proportions

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of two parts of cement to one part of sand are used to make the saucer-like depressions which form the pools.

This material will of course be used in conjunction with the natural stone used for the remainder of the rock garden, and the shape will be so modelled that the front edge of each of the pools protrudes a little, in the form of an overhanging rock. This edge will be lower than the other edges of the basin. The difference in the level need be very slight, as only a trickle of water is necessary to splash over the edge in an attractive cascade. Each pool will be placed so that it receives the water from the one above, but the water need not splash direct into an open pool, it can splash down on to rocks or pebbles and trickle through them into the pool. The surplus water will again tumble over the front edge to the rocks or pool below.

It is a general rule in planting informal pools that the rocks should not quite come to the edge of the pool, but that there should be a margin of moist soil between the large rocks and the water. This margin can then be planted with drifts of colourful bog plants such as the Golden Mimulus (Monkey Musk) or blue Myosotis palustris (Water Forget-me-not).

Considerable art can be displayed in the planting of these waterside drifts as in a natural landscape. The tendency in Nature would be for the group of plants to overflow on to the ledges below, just as the water overflows from one pool to another.

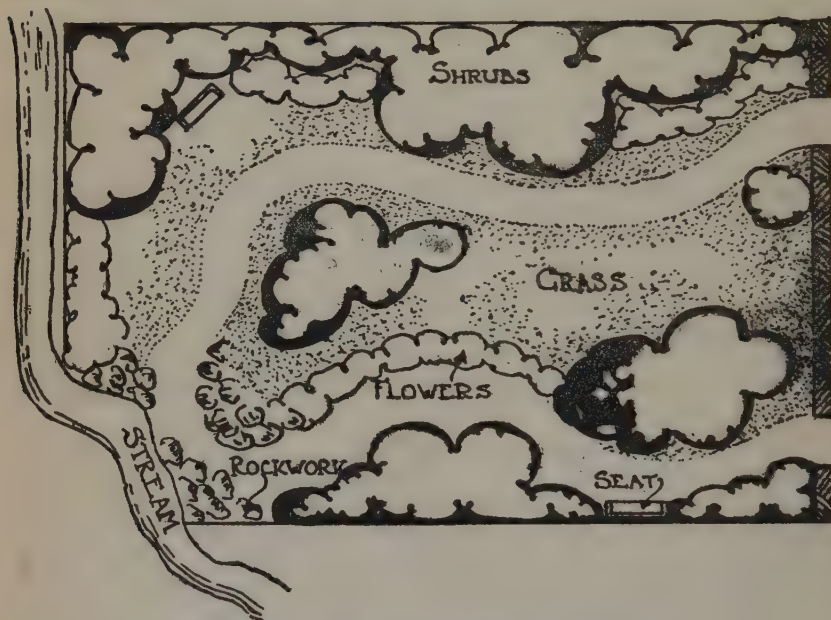
The wise gardener will follow this method, and when he plants say half a dozen Forget-me-nots in one group he will put one or two odd plants in the pocket below as if they had strayed there by the hand of Nature. In addition to the Forget-me-nots and Musk already mentioned, some of the best marginal plants for this situation in the rock garden are as follows: The waterside Irises, *I. Kaempferi*, *I. laevigata*, *I. Monnieri*, *I. ochroleuca*, *I. pseudo-acorus*, *I. Sibirica*, *I. versicolor*. Primulas such as *P. Bulleyana* and hybrids, *P. Florindæ*; a giant species 3-4 ft. high, with bold tufts of foliage and pale yellow flowers, exceedingly decorative. *Parnassia palustris*, *Spiræa*, *Trollius* (Globe Flowers), the large-leaved *Gunnera*, and Marsh Marigolds (*Caltha*).

The Care of Water Features.—Occasionally in the life of any small pond it will be found desirable to give it a thorough clean out.

In a small pool the best way to arrange for an outlet for cleaning purposes is by way of a plug in the bottom, accompanied by a sump into which the water will go. Failing this, the hose method of siphoning the water away, as already described, is satisfactory and simple. Once filled, a small pool does not need a constant flow of water. Even if Water Lilies are being grown it is quite sufficient to keep up the water level by the use of the garden hose after a dry day. If movement is wanted a fountain will be sufficient to cause ripples on the surface.

In larger pools an economical way of arranging for a regular fountain supply is by the installation of a small electric pump. This uses the same water over and over again, returning it via cascades or fountains, according to the type of water garden.

A correct balance between the plant and animal life in a pond of any size will keep the water fresh even though it is not part of a running stream.



Design for a Bog garden, suitable for a damp, low-lying site

For the stream and its banks.—*Caltha* (Marsh Marigold); *Carex* (broad-leaved rush); *Iris pseudo acorus* (yellow flag); *Mentha aquatica* (water mint); *Myosotis palustris* (water forget-me-not); *Sagittaria* (arrow head).

Flowers for growing amongst the shrubs.—*Astilbes*; *Cardamine* (cuckoo flower); *Bupthalmum speciosum*; *Funkia*; *Irises* (*Koempferi* and *sibirica*); *Mimulus*; *Primulas*; *Senecio Clivorum*; *Thalictrum glaucum*; *Trollius*.

Trees and Shrubs.—*Alnus glutinosus*; *Andromedas*; *Azaleas*; *Betula alba* (silver birch); *Cornus alba*; *Myrica gale*; *Salix Babylonica*; *Spirœas*; *Viburnum opulus*.

Green Surfaces.—A green surface growth known as "Blanket weed" often troubles the owner of a garden pond. This can usually be removed with a stick as soon as it appears. When it gets the upper hand, potassium permanganate, or copper sulphate, in a muslin bag, dragged through

WATER FEATURES

the water is effective if done at the right stage of growth of the "blanket weed." Care is needed in this if fish are present, or they may easily be killed.

In autumn, a wire mesh screen placed across the part of a pool which is nearest to trees is useful, to prevent quantities of leaves from falling into the water.

Fish in the Water Garden.—Plants should be placed in the pool some three or four weeks before the fish are introduced. This gives the pool time to mature a little, and the fish will consequently have a better chance of success.

Good-sized fish, say not less than 5 in., are the best to buy, and a 400-gallon pond will take 80 fish this size (a rule to follow is 1 in. of fish to each gallon of water). It is best, however, to stock a new pond gradually, and in any case a pond should never be stocked to its full capacity.

Some of the most ornamental fish for garden ponds and pools are the Golden Orfe, Golden Carp, Golden Tench, and Goldfish. These like fairly shallow water, planted with Elodea and other oxygenating plants. They are best fed with proprietary fish-foods. A good plan when many fish are kept is to have a separate aquarium for fish which seem to be "off colour." There the fish can be fed with special foods, and cured before they are put back in the pond.

Planting the Water Garden.—There are many types of plants which can be accommodated in the water garden. The first favourites are the Water Lilies or Nymphæas. These are usually planted first in a basket of loosely-woven material; they can be bought packed like this from the nurserymen, if desired, and merely set in the bottom of the pool. Large varieties should be at least 6 ft. and smaller ones 3 ft. apart. 2 ft. to 2 ft. 6 in. is deep enough for most Nymphæas, and the pygmy varieties will grow in a depth of 18 in.

May is the best month for planting, and the best soil is heavy loam and well-decayed manure. Coarse bone-meal can be used as a substitute for manure.

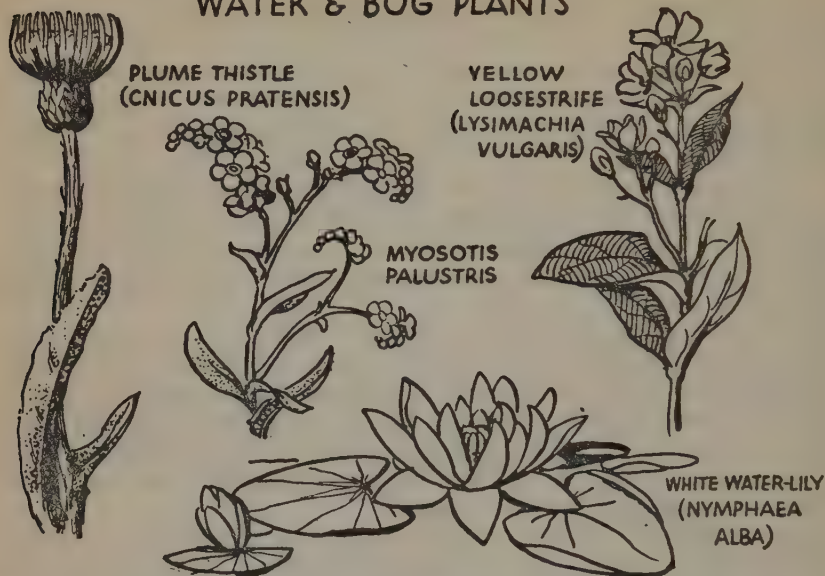
A large number of the Water Lilies are perfectly hardy and can remain where they are planted, all winter. A few (including the blue varieties) are not perfectly hardy, and must be lifted and kept through the winter in a tank in the greenhouse. This would entail considerable trouble in the average small garden, and the amateur is therefore advised to keep to the hardy kinds for the small water garden.

As an alternative to the use of baskets for planting, beds of soil can be arranged at the bottom of a formal pool, or a good 6 in. depth of rich soil, including bone-meal, can be laid all over the bottom of the pool. If the method of making beds of soil is adopted, they are usually bricked

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round so as to keep the soil in place. The soil used is a very fibrous turfy loam enriched with bone-meal.

WATER & BOG PLANTS



PLUME THISTLE
(CNICUS PRATENSIS)

YELLOW
LOOSESTRIFE
(LYSIMACHIA
VULGARIS)

MYOSOTIS
PALUSTRIS

WHITE WATER-LILY
(NYPHAEAE
ALBA)

Brightly coloured flowers add a great deal to the charm of a water garden on a hot summer's day

Water Lilies can even be planted by the simple method of tying them between a couple of turves and dropping them into the pond.

True Aquatics.—These are the plants whose roots are totally submerged, though they have floating leaves. Some are very decorative, as, for example, the water lilies. Some are wholly submerged and are extremely useful as oxygenating aquatics. Some like to have their roots submerged, but grow best on the margins of ponds and streams. These all grow well in heavy meadow loam or turf, about 3 in. thick, in which the stems are inserted. Roots soon form and the plants then rapidly become established.

Waterside Plants.—In addition to those plants which like their roots actually in the water, there are some which will grow in boggy soil at the waterside. These groups include many fine trees and shrubs as well as ferns and flowering plants. Some of the finest for the amateur's garden are given in the following lists.

WATER FEATURES

WATER LILIES WHICH WILL GROW IN 3 FT. OF WATER:

Nymphaea alba.—Is frequently found in large lakes and slow-running rivers. Large foliage, flowers flat on the water, white. Unsuitable for small formal pools.

N. Gladstoniana.—Has exceptionally large white pæony-shaped flowers filled with golden-yellow stamens, fragrant. Only for pond or lake cultivation.

N. tuberosa Maxima.—A vigorous-growing variety, with shell-shaped petals, white. Suitable for large lakes in 3-4 ft. of water.

N. Richardsoni.—Large snow-white flowers, with green sepals, and golden-yellow stamens; only for lakes. Flowers early and continues through September.

WATER LILIES WHICH WILL GROW IN 2 FT. OF WATER:

N. atropurpurea.—A brilliant intense dark crimson with golden stamens.

N. Escartouche has vermilion scarlet flowers, lasting many days, and crimson flushed stamens.

N. gloriosa.—The flowers are sweetly scented and bright currant-red with a mass of rich red stamens.

N. James Brydon.—Large flowers of rich rose-crimson. It likes plenty of room.

N. lucida.—Another star-like lily, but of a deep rich pink shade. It has large olive-green marbled leaves. It is one of the older well-tried varieties.

N. marliacea albida.—In this very large snow-white flower the stamens are bronzy green. It is very fragrant.

N. marliacea chromatella.—A yellow lily. Very large. The dark foliage has reddish-brown spots freely distributed over the upper surface.

N. Masaniello.—Has pæony-shaped flowers, of rich carmine-rose colouring, spotted carmine. The flowers stand several inches above the water-level on stiff stems.

N. Moorei.—The flowers are a soft canary yellow, large foliage, pale green.

N. Mrs. Richmond.—Pale rose-pink flowers, slightly flushed white, attractive light-green foliage.

N. Murillo.—Deep rosy-red, star-shaped flowers, outer petals nearly white, sweetly scented.

N. odorata.—This pure white lily blooms in the early weeks of June. The foliage is pale green. The plant comes from North America, and is very fragrant.

N. tuberosa rosea.—Strong growing variety, bright green foliage.

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profusion of medium-sized flowers, delicate shade of soft pink, shaded white; fragrant.

WATER LILIES FOR 1 FT. OF WATER:

N. Albatross.—Large, star-shaped, snow-white flowers, with golden-yellow anthers, dark green foliage.

N. Conqueror.—Bright coral-red, large open flowers, spotted white.

N. Ellisiana.—Dark olive-green foliage, medium-sized flowers, brilliant vermilion-red, with rich orange stamens. Suitable for small tanks or tubs.

N. Firecrest.—A fine bright pink, with large stamens of an orange shade tipped with red.

N. Frieбели.—An old variety with dark green foliage and rich claret-coloured flowers. Very fragrant.

N. odorata rosea.—Soft rose; medium-sized flowers.

N. Phoenix.—Immense deep rose flowers, spotted white.

N. Robinsoni.—One of the richest of the lilies, being a vermilion-crimson, and star shaped. Large spotted green leaves.

N. sanguinea.—Brilliant shade of crimson-carmine, with clusters of orange-red anthers, large green foliage, spotted maroon.

WATER LILIES FOR 6-12 IN. OF WATER:

N. Aurora.—This charming lily on opening is a pretty shade of soft rosy-copper-yellow, varying as the flowers age to deep orange-salmon, finally to ruby-red; foliage is marbled.

N. candida.—Small snow-white flowers with red stigmas. Attractive light green foliage, erect stems. Suitable for small pool or tub.

N. chrysantha.—Attractive dark green foliage, mottled maroon, medium-sized flowers, passing from yellow to cinnabar-red.

N. Helen Fowler.—Rich green foliage, stout stems bearing pink flowers, with a delightful fragrance. A very charming variety for tubs or small pools.

N. Laydeckeri fulgens Lilacea.—Pretty light green foliage, flowers soft rose and white, passing with age to rose and crimson. Flowers sweetly-scented; blooms late summer and autumn. A suitable variety for tub cultivation.

N. L. purpurata. Flowers in profusion from June till October. Suitable for small or large pools, or tubs. Large dark green foliage; flowers wine-red, to crimson, flaked white, orange-red stamens.

N. L. Luciana.—Rich rose star-shaped flowers, suitable for small pools or tubs.

N. L. minor.—Small pale green leaves, tiny star-shaped snow-white flowers, profusely produced, sweetly scented. Can be grown in shallow water in a sunny position. Suitable for tub culture.

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N. Pink Opal.—A pretty shade of deep coral pink. Suitable for shallow pools or tub culture.

N. Seignoureti.—Charming shade of buff-yellow, shaded pink and orange-red, erect stems, dark green mottled foliage.

AQUATICS FOR OXYGENATING

These are very useful as oxygenaters and to provide protection for young fish:

Callitriche aquatica (verna) (Water Starwort).—A native species affording protection and shade for young fish and water insects; as their dense tufts of pea-green underwater foliage come to the surface during summer.

Cardamine lyrata.—Has thin wiry stems delicately clothed with round pale green foliage; with several small white flowers. It comes from China.

Elodea callitrichoides.—Suitable for aquaria cultivation; producing pea-green, finely-divided foliage, affording protection for young fish during the breeding season.

E. canadensis (Water Thyme).—Although it chokes streams and rivers, it is easy to reduce when it threatens to choke tank or pool. From running root-stocks many stout stems densely clothed with narrow dark green leaves, quickly form a dense mass of foliage; this makes a good spawning ground.

Isoteles lacustris (Quillwort).—This is found in nearly every part of the country; forming tiny tufts of upright, dark green, quill-like foliage.

Lobelia Dortmanna (Water Lobelia).—A charming underwater species; forming dense carpets of foliage at the bottom of tank or pool, from which slender, wire-like stems grow 6 in. above the water level, with numbers of pale blue flowers.

Ludwigia (Swamp Loosestrife).—When grown in shallow water, dense, creeping masses of attractive foliage with insignificant yellow flowers are produced; the dark green foliage is heavily flushed bright rose; it likes bright sunshine.

L. Mulertii, large bright green leaves flushed rose.

L. natans, young foliage light purple, turning green as they age.

L. palustris, small bronze-green foliage.

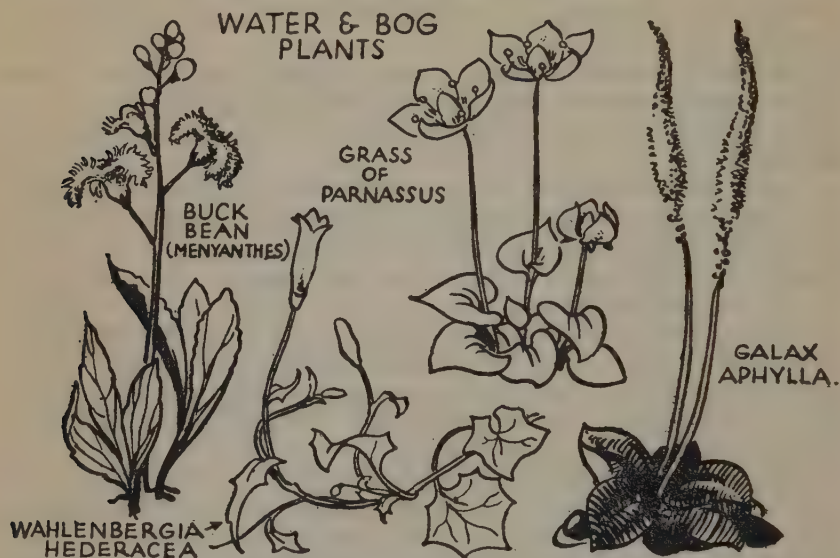
Myriophyllum (Water Milfoil).—An important genus of underwater perennials found in nearly every part of the world; suitable for pool or aquarium.

Potamogeton pectinatus.—Thin stems and narrow leaves make good shelter for small fish.

Ranunculus aquatilis (Water Crowfoot).—Will grow in still or running water. Its dark green foliage and pure white flowers grow quickly. The underwater foliage is finely cut.

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Vallisneria spiralis (Tape Grass).—An invaluable species for the aquarium; almost transparent foliage, rising vertically to the surface of the water. The female flowers are carried on thin spiral stems floating on the surface of the water; the male flowers on short stems at the base; when ripe the male flowers detach themselves, rise to the surface and



Marginal water plants grow with their roots submerged and can be planted to soften the outline of a pool

remain till they have fertilized the female flower; the latter then descends to ripen her seed.

V. gigantea. This has broad, dark green foliage, 3 ft. long, and is a good subject for large aquariums or deep indoor tanks.

FLOATING AQUATICS

These seem to require no soil, but flourish floating on the water surface. This of course makes them very useful for small ornamental pools. They are not always hardy right through the winter out of doors.

Azolla caroliniana.—Spreads very quickly into a dense mass of foliage, of a pale moss green, but turns red in the sun in the autumn. It needs to be kept under control.

Ceratopteris, or Water Fern.—This nearly resembles the Stag's Horn Fern, and makes a charming floating plant.

Eichornia (The Floating Water Hyacinth).—This is a remarkable

WATER FEATURES

water plant, as parts of the leaves are inflated to act as floats. No soil is needed, on account of this peculiarity. The delicate lavender-blue flowers have a peacock eye. It is suitable for tanks, bowls, or aquariums where goldfish are kept, as they deposit their eggs in the roots.

Hydrocharis Morsus Ranæ (Frog-bit).—A native species, suitable for small pools or aquariums; has dark green leaves floating on the surface of the water. Small white flowers in great profusion during the summer; very hardy, and will succeed in sunny or shady situation.

Lemna (Duckweed).—It has no stems or leaves; the small leaf-like fronds float gracefully on the surface, affording shade for fish: nearly all hardy fish feed on the small plant.

Stratiotes aloides (Water Soldier).—Resembles the spiny foliage of a pineapple. It remains below the water during the greater part of the year, rising to the surface to produce its attractive snow-white flowers.

Trapa natans (Water-Chestnut).—From a curiously-formed nut thin stems issue, terminating with large rosettes of olive-green foliage, has small, pure white flowers.

DECORATIVE AQUATICS

These grow with their roots submerged, but they bear decorative blooms which stand above the water-level.

Acorus Calamus (Sweet Flag).—Very valuable for its medicinal and aromatic properties. Its scented rootstock is used by perfumers. Dark green sword-like foliage, which forms an effective group. 3-4 ft.

A. variegatus.—Dark green variegated leaves in white, rose and gold. 2½ ft. Very distinctive.

Alisma natans (Water Plantain).—Slender foliage which floats on the water, bearing many small, star-like, snow-white flowers.

A. ranunculoides.—Lilac flowers and thin floating foliage. 1½ ft.

Aponogeton angustifolium (Cape Pond Weed, Water Hawthorn).—White wax-like flowers, delicately perfumed, 2-3 in. floating leaves. This plant requires a sheltered position.

A. distachyon.—Very beautiful flowers, white with black anthers, and foliage attractive. Quite hardy, and succeeds in from 6-18 in. of water. Attractive lanceolate foliage, large furcate flower, snow-white, with jet-black anthers, with the powerful fragrance of the Hawthorn. Can be successfully grown in 6-18 in. of water; hardy.

Bidens cernua (Bur-Marigold).—Annual. Yellow flowers. Very effective in groups. 15 in.

Calla æthiopica (Bog Arum).—Rose-coloured flowers and dark green leaves. Creeping roots. 2-4 ft.

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C. palustris.—Small white arum-like flowers; bright green foliage. Requires shallow water and grows to 9 in.

Caltha palustris (Marsh Marigold, King-cup).—The wild king-cup seen in marshy places in Britain. 12-18 in.

C. alba.—The white form. 9 in.



Plants which grow in the boggy soil beside streams or ponds should be planted in bold drifts

C. monstrosa plena.—Rather rare, but very effective. Double golden-yellow flowers and stout, creeping stems. Flowers borne in early spring. 15 in.

Carex pendula (Sedge Grass).—Masses of broad, sword-shaped foliage. 3-4 ft. high, bearing drooping sprays of brown spikelets.

C. pseudo-cyperus.—Early-flowering species, broad foliage, stout stems with crowded heads of green plumes. 2½ ft.

Comarum palustre (Marsh Potentilla).—Creeping foliage; small, crimson-purple flowers. 9 in.

Cotula coronopifolia.—Annual golden-yellow buttercup-shaped flowers which are borne continuously throughout the summer. Bushy foliage. 9 in.

Cyperus alternifolius (Umbrella Grass).—Tall, naked stems bearing

WATER FEATURES

decorative heads of dark green leaves. Very decorative and succeeds in shallow water, valuable for table decoration, thriving indoors. Plant in 5 in. pots, standing in shallow saucers filled with water. $2\frac{1}{2}$ ft. Not hardy.

Eriophorum angustifolium (Cotton Grass).—A perennial, forming tufts of rush-like foliage from which rise slender stems, terminating with snow-white, silky tufts. Still used in country districts for filling pillows and making candle-wicks.

E. vaginatum (Hare's Tail Cotton Grass).—Tufts of grass-like foliage, and cottony flower heads.

Glyceria spectabilis variegata.—One of the most graceful grasses; regularly striped, tinted rose during the spring and early autumn. 2 ft.

Gratiola officinalis (Hedge Hyssop).—The leaves and roots of this charming plant are said to be of medicinal value; serrated foliage, small blue flowers. 9 in.

Heteranthera graminea (Leptanthus).—This species can be grown in any water; creeping masses of bronze-green foliage, soft-yellow star-shaped flowers.

H. reniformis (The Mud Plantain).—Trails prettily over the surface, with pale-green kidney-shaped foliage and soft-blue flowers.

H. zosterifolius.—Produces dense carpets of light-green foliage, with clusters of pretty pale-blue flowers; shallow water.

Iris Sibirica or Siberian Iris, with its narrow sword-like leaves often as high as 4 ft. planted in bold groups is one of the most outstanding of waterside plants. Good varieties are:

"Dragonfly," pale blue and violet.

"Kingfisher," deep bright blue.

"Perry's Blue," sky blue.

"Pigmy," dark violet.

"Orientalis Emperor," deep violet blue.

"Snow Queen," pure white.

Iris Kaempferi or Japanese Iris, can also be used for waterside planting, and as it includes pinks and yellows, gives a pleasant variation to the *Sibirica* variety. Some good named varieties are:

"Amethyst," mauve-purple.

"Cherry Blossom," pink and white.

"Emperor," reddish brown.

"Silver Sea," white and pale blue.

"Storm Cloud," purple blotched yellow.

"White Queen," pure white.

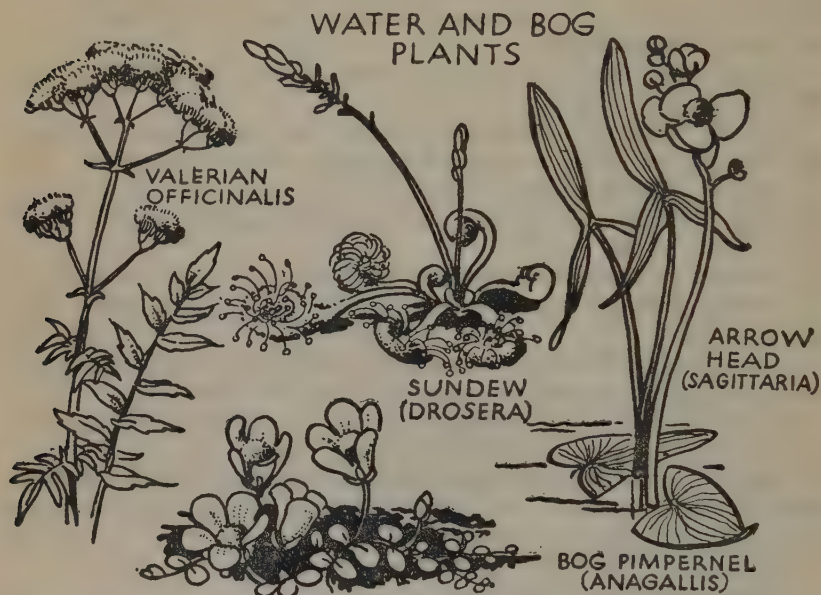
Jussiaea repens.—A rampant grower with masses of bright-green foliage floating on the water; freely studded with golden-yellow flowers.

J. grandiflora (Water Evening Primrose).—It forms erect bushes of

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attractive foliage with numerous axillary flowers, bright golden-yellow. 3-4 ft.

Limnanthemum indicum (Water Snowflake).—Heart-shaped, light green foliage and clusters of snow-white fringed flowers; a good plant for the aquarium, shallow pools or pans.



Once established, the water and bog plants increase very rapidly, and plenty of room should be allowed for their development

Limnocharis Humboldtii (Water Poppy).—A handsome species for either shallow or deep water, medium-sized heart-shaped leaves, with delicate shade of rich yellow.

Lysimachia japonica (Moneywort).—It has masses of bright golden-yellow foliage and rich yellow flowers. 4 in.

L. Nummularia. This variety will accommodate itself to any position in or near the water; dense carpets of bright-green foliage, smothered with golden-yellow flowers. (Creeping Jenny.)

Mentha aquatica (Water-mint).—Strong growing native species; heart-shaped, aromatic foliage, clustered heads of lilac-coloured flowers; suitable for aquariums or ponds as it keeps the water sweet and clean.

M. sylvestris.—Hoary foliage, flowers small. Can be used in wet mud or 5-6 in. of water.

Menyanthes trifoliata (Buckbean).—This very attractive white

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water plant is easily grown. It has a creeping rootstock, and three-leaved foliage. About 1 ft. high.

Mimulus luteus (Monkey Musk).—This has thin wiry foliage, bearing tufts of rich golden-yellow flowers. About 1½ ft. high.

Myosotis palustris (Water Forget-me-not).—This delightful little blue flower should not be omitted from any water planting scheme. It will do well either on the margin or actually in 2 or 3 in. of water.

Ranunculus plenus or White Bachelor's Buttons.—Has small double white flowers produced in great confusion. They make good cut plants in May.

Ranunculus acris plenus (Yellow Bachelor's Buttons). Similar to the above and suitable for bog planting, but blooms in the late summer and autumn.

Richardia africana (Arum Lily).—This can be grown in the open pools, providing it is planted in 12 in. of water; it has attractive bright green leaves, and bold snow-white blooms.

Rumex hydrolapathum (Water Dock).—Only suitable for large pools; bold dark-green foliage, turning to bronze and crimson; very effective when planted in bold clumps by the lake side. 4-6 ft.

R. maximus.—Strong-growing Manchurian species; bright green foliage turning to crimson during the early autumn. 3 ft.

Sagittaria brevirostris. Suitable for aquarium or pool; underwater foliage broad, strap-shaped; slender stems rising well above water-level, small snow-white flowers.

S. graminea.—Narrow grass-like foliage; with whorls of snow-white flowers.

S. isœtiformis.—Extra narrow-leaves, tiny white flowers.

Stachys palustris (Marsh Stachys).—A bog perennial; with slender stems and narrow tapering foliage with whorls of small pale-purple flowers. 1 ft.

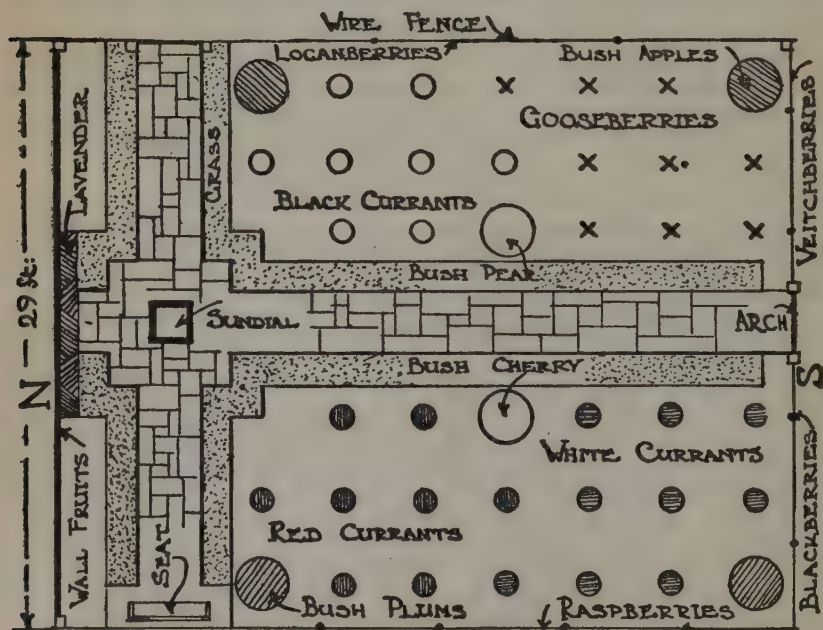
Veronica beccabunga (Brooklime).—Light-blue flowers; dark olive-green foliage. 9 in.

CHAPTER XI

FRUIT GARDEN—PLANTING AND MANAGEMENT—POPULAR FRUITS AND THEIR CULTIVATION, WITH EXHIBITION HINTS

THE FRUIT GARDEN

THERE is no garden which cannot be made to grow fruit, and there is hardly any garden where fruit will not grow really well if care is taken in the preparation of the soil. Even in the little "back-yard" garden of the older town districts, where soot and grime seem such a nuisance, fruit trees will grow and flourish quite well, though the fruit is perhaps not so appetizing as when grown in the purer air of country districts. At the same time, fruit trees are so ornamental, and because of their dwarf stature they are so suitable for small



A small fruit garden can be made a decorative garden feature, as shown in this layout

THE FRUIT GARDEN

gardens, that amateur gardeners ought to pay more attention to possibilities in this direction.

A standard fruit tree makes an ideal background for a mixed border. It breaks the skyline, and converts a patch of ground from a "glorified allotment on which flowers are grown" to a real garden.

If a flowering tree of any kind is to be included in the garden scheme, it seems a pity that a tree should not be chosen which will not only flower in spring, and carry ornamental foliage in summer, but will bear decorative and profitable fruits in the autumn. Every Nature lover will agree, too, that a tree in winter, outlined in all its naked loveliness against a drifting, cloudy sky, gives character to the landscape as no other feature can. A tree does not altogether change, as seasons pass. Its outline becomes familiar; it ceases to be inanimate and becomes a friend.

WHEN FRUITS FAIL

Quite a number of amateurs have probably been discouraged from growing fruit by hearing of gardens where fruit trees seem to flourish well but do not bear any harvest of fruit. Unless the garden is completely shaded at all times, such as in the case of a garden under, or very close to, tall trees in town districts, a fruit tree could certainly be brought into a healthy-cropping condition and, if possible, the trouble should be traced to its source. It is more than probable that it is due to soil conditions, which can be very simply rectified.

Even in gardens where such trees as apples, cherries, plums and pears cannot find a home some of the other fruits might be grown. For instance, Morello cherries will grow in that most difficult of all positions, on the north side of a tall brick wall. Fan-trained trees grown here would occupy very little garden space and would quickly come into bearing.

CURRENTS ON ROOFS

Loganberries can be grown in the form of a boundary hedge if trained to horizontal wires. I have even heard of successful gooseberries and currants grown as pot plants, cordon trained, on the roofs of town houses, and also of strawberries grown in an ordinary wooden tub; plants were set in holes made in the sides of the tub, while the tub itself was filled with soil into which the roots penetrated. It will therefore be seen that it is only lack of keenness on the part of most amateur gardeners which makes fruit gardens so rare, and those who feel at all inclined to add to the family larder, as well as to their own interest in the garden, and to the general prosperity of the community, by encouraging Nature's generosity need not fear that their plot of ground will not grow fruit.

WHAT TO GROW

The choice of fruits to grow is really the first step in making a fruit garden. With regard to the larger fruit trees, bush trees are the most satisfactory, though standard trees are more ornamental and should be preferred for certain situations. It is advisable, however, for the small orchard to be planted with bush trees, partly because they are easier to prune and spray regularly, and partly because it is easier to gather the fruit from them when it is ripe.

Cordon trees, that is, trees trained so that the flowers, fruit and foliage are all carried on one or two main stems, are frequently used along the sides of paths or against walls where space is very restricted. They are admirable for the purpose, and crop very heavily if they are well trained and cultivated, but the pruning of these trees is a matter for experts (whether amateur or professional), and the novice is advised to ignore this class of tree unless he is prepared to study the subject seriously or to call in the services of an expert about twice a year, in the summer and winter.

The small fruits such as black currants, gooseberries and red currants are grown about five feet apart each way, and can be planted between the bush apples and pears. A small fruit garden is probably best planted with mixed fruits so that a succession and a variety of fruit is available for home use. In the commercial orchard, of course, large acres are devoted to a single variety in order to make the work of pruning, gathering, etc., easier to manage.

SOIL PREPARATION

Any soil that will grow good vegetable crops will grow good fruit. Actually any soil can be brought to this fertile condition by deep digging and manuring. Cold, heavy soils need to be dug to a depth of about two and a half feet in order to break up the soil below and to allow surplus water to drain away. The usual additions to soil to bring it into a normal healthy condition should be made. That is to say light, strawy manure and gritty material of all kinds should be added to clay, and fibrous vegetation should be added to light, sandy soils, together with cow or pig manure, if obtainable. All fruit gardens also need annual dressings of lime.

GREEN MANURING.—For the home gardener the small fruit orchard is the only place where green manuring is a practical proposition. This entails the thick sowing of seeds, such as brown mustard or lupin, at the rate of 1 pint to a 10-rod plot, and digging it in as soon as full grown, but before it flowers, thus enriching the ground and rendering it more friable. Friable soil means hard wood, and hard wood results in firmer

THE FRUIT GARDEN

buds and better crops. So whenever the soil below young fruit trees is not in use as a vegetable or salad garden, the opportunity should be seized to improve it by this means.

To know whether the soil needs more than an ordinary amount of drainage, a hole three feet in depth should be dug. If water collects in this hole instead of draining away, special precautions should be taken over drainage before any planting is done, to prevent trouble later.

Poor soil will benefit from a good dressing of old stable manure, but fresh manure should not be used at planting time.

PLANTING HINTS

The best time to plant is in late autumn when the leaves are absent from the trees and before the worst of the winter frosts arrive. Actually, fruit trees can be planted at any time during the winter, but if planting is left until rather late in the season it may be that dry weather will occur which would be fatal to the newly-planted trees. When the trees are ordered from a nursery they will arrive in bundles with their roots protected by straw-wrappings. These should be removed and if the roots are dry they can be stood in water for an hour or two, or they can be laid in a trench with moist soil thrown on them, and left there even for a week or two if it is inconvenient to plant at once. No planting should be done when the soil is frosty, and it is far better to heel in the plants, or to store them in a shed, keeping the roots moist, until the weather is suitable for planting. It is best to open out holes for the reception of the roots *before* the plants arrive from the nursery. The holes should be large enough to allow the roots to be spread out as far as possible almost horizontally. After taking out the hole and breaking the subsoil, a little of the top soil should be thrown back into the centre, so that the tree when it is resting on this slight mound, will be at the same level as it was in the nursery. This can be noted by the appearance of the soil mark on the main stem. As the tree is put in position, a stake should also be driven in, before the soil is put back into the hole. This avoids any possible damage to the roots when driving in the stake. The roots, as they are spread out, should be examined, and any that are damaged should be cut clearly away. Fine soil will be thrown over the remainder and trodden down firmly before the hole is actually filled in. More treading round the plant will make it firm in the soil, so that it does not sway in the winds. It should be tied immediately to the stake, and a label also tied to the stake. One important point to remember is that the stems of fruit trees swell as they grow, and a tie made the first year after planting will probably be too tight the next season. Such ties should be examined at fairly regular intervals, and loosened and re-tied where necessary, otherwise, if the

trees swell too much, the string used for tying may cut into the bark, and the result may be the death of the tree.

The planting of all fruits, bush apples, gooseberries and currants, loganberries and even strawberries is on much the same lines; that is to say, the ground must be well dug and well drained. If there is any doubt about the drainage, rough material should be put in at the bottom of the deep hole before the soil is filled in again. Also firm planting is essential in all cases, otherwise the roots may be dried out in air pockets in the soil, instead of being in direct contact with moist particles of soil.

FIRST PRUNING

The rule is to prune, not at planting time, but fairly soon afterwards. The reason it is not done at the same time as planting is chiefly that the plant has had one shock, from being moved from nursery to garden, and the pruning would be a double shock, which might prove too much for it. The first pruning should not be too severe, it may be better sometimes to wait until the following winter. But the second season's winter pruning should be drastic, as the more pruning is done while the tree is young, the more likely is it to establish itself and become a strong, healthy specimen. All standards and bush trees should have their leaders shortened 6 in. or more in the winter after planting, and if the growth during the first summer seems rather weak, pruning should be even more severe the following winter; that is to say, the stems will be cut back to below the point of the first season's pruning.

SUBSEQUENT PRUNING

It is far better for the amateur gardener to make himself acquainted with the general principles of pruning than to worry too much about the particular method of pruning a particular tree.

The first point to note is that fruit is borne on wood of a different age, according to the type and variety of tree. For instance, apples bear fruit on wood that is two years old, after which the same wood bears fruits from year to year for many years afterwards. Black currants fruit on stems that have grown the previous summer, and these stems after fruiting once do not fruit again. Grapes bear fruit on the current season's growths.

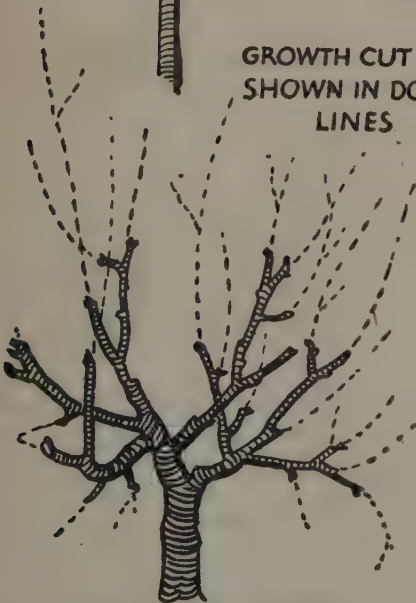
To note these differences with each kind of fruit that is grown, and to act accordingly, is the real secret of pruning. For instance, if you are pruning plums, apples, pears, sweet cherries, or red and white currants, all of which fruit on old wood, you try to build up a skeleton of main branches, but whereas with apples you cut to the second *outside* bud of the laterals to promote outward branching, with plums which spread too freely you cut to the second inside bud to induce a more

PRUNING

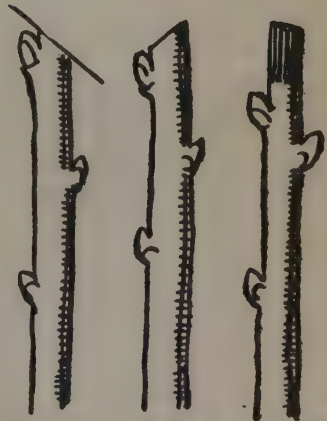
PRUNING
A PYRAMID
PEAR

PRUNING A
STANDARD
PLUM.

GROWTH CUT AWAY
SHOWN IN DOTTED
LINES



A SMALL BUSH APPLE.



RIGHT WRONG WRONG

Fruit trees need annual pruning to keep them shapely. Always make the cut towards a bud pointing outwards

upright growth. After the summer growth you cut back all the young shoots that are not wanted (to extend the size of the tree) to within about an inch of the old wood.

In the case of the fruits like black currants, raspberries and loganberries and also the Morello cherry and peaches or nectarines, where the fruit is carried on the wood that grew in the previous season, you prune by removing all the wood that has fruited, leaving only the young shoots to provide the following year's harvest. This kind of pruning is done immediately after fruit has been gathered.

SUMMER PRUNING

Summer pruning, which is the most troublesome to amateurs, *need not be done at all* in many cases, and if it is, it should only be done by those who have made themselves thoroughly conversant with the reasons for pruning. The theory of summer pruning is that pinching back the side growths of new wood on the tree will induce the formation of fruit spurs near the base of each stem, that is close to the old wood. Instead of these side growths being allowed to grow on until the winter, and to be cut back then, they are pinched off in July about six or nine inches from the old wood. The sap concentrates then in the basal buds, so that the formation of flower buds is encouraged. When winter comes, the pruning is carried out in the normal way; that is to say, the stems are again shortened to just beyond the fruit buds. This type of pruning can only be done with those fruits which regularly make fruit spurs in this way, and not, of course, with such fruits as black currants and raspberries.

Summer pruning in the hands of the novice sometimes merely results in a feathered growth of young stems all over the tree, instead of the formation of fruit buds. That is why experts advise the novice to ignore summer pruning altogether.

One last point about pruning: be very careful to use clean, sharp tools. The damage done by the use of blunt tools or dirty tools cannot afterwards be repaired. It is through carelessness in this matter that diseases and pests find their way into the trees. Also remember that a symmetrical tree is more likely to be healthy than one which is unbalanced. Sun and air reach all the branches if they are well placed, instead of being crowded to one side of the tree, and there is also less likelihood of damage by winds to a tree which is well balanced than in the case of a tree which is lopsided.

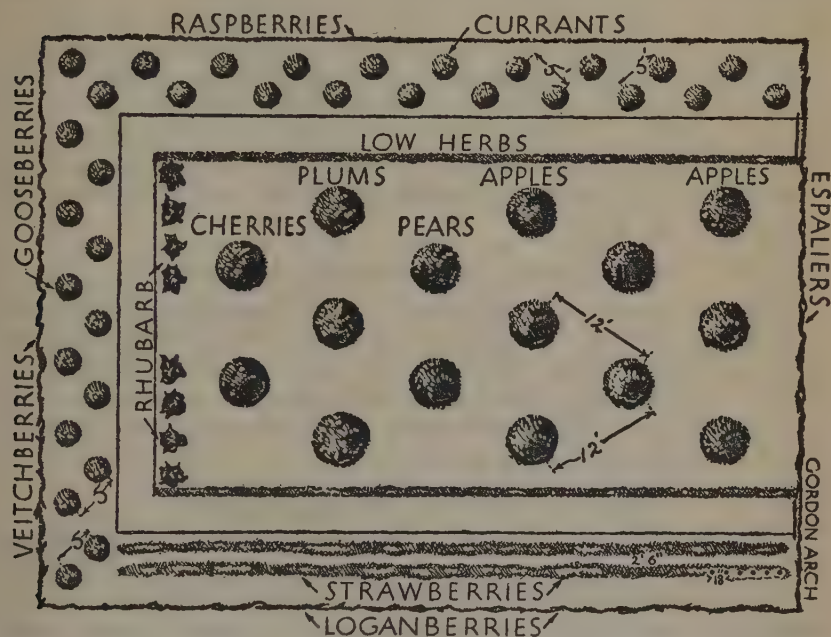
PLANTING OF A SMALL FRUIT GARDEN

As a definite scheme for planting a small fruit garden I should recommend a few bush apples, pears and plums, standard cherries, and either

THE FRUIT GARDEN

loganberries, Morello cherries (fan trained), or other wall-fruits, to cover the walls and fences according to aspect. Bush trees are planted from ten to twelve feet apart. Standard sweet cherries will grow to an enormous size, and as much as twenty-four feet must be left between each.

The first step in planting a fruit garden would be to arrange these larger trees as desired, and as seems most convenient. Bush trees of



When planting a fruit garden, arrange as far as possible for all the soft bush fruits to be planted together so that they can easily be netted against birds

quickly-maturing type can be chosen to plant between the taller standard trees, so that in years to come, when the tall standard cherries are really at their best, it may be possible to take out some of the bush trees altogether, without feeling that it has been waste of time to grow them.

HOW STOCK AFFECTS TREES

The age at which a tree comes into bearing depends very largely on the stock on which it is grafted. By consultation with the fruit grower from whom the trees are ordered, it is possible to obtain small bush trees, that will mature quickly, and provide a good crop of fruit in the first ten years after planting. These would be used to interplant

among varieties which do not reach their best until the end of the decade, but which will then need more space.

When the larger trees have been arranged in the fruit garden, the small bush fruits should be allotted a place. These must be allowed 5 ft. between the rows. (It is possible to grow a few vegetable or salad crops between these bushes in the first two years of their existence, though later the fruits will occupy the whole of the garden space.) Loganberries and similar berries will be planted about ten feet apart against the fences. Though it is not essential, it is certainly desirable that most of the fruit in a garden should be planted in one section. This makes it possible for a light framework of wood to be erected, over which nets can be stretched during the fruit season, to keep the fruits safe from the attacks of birds. A *movable* protection is advised, for at other seasons birds do an enormous amount of good in the fruit garden, by devouring insect pests.

REMEMBER THE WHEELBARROW

It is important to allow, in the fruit garden, solid paths or soil tracks over which manure can be wheeled. It is not advisable to plant fruits in grass. The soil should be cultivated round the bole of the tree, for at least five years after planting. It does not seem to harm very old fruit trees if grass grows beneath them, but it has a definitely harmful effect on the health of young trees.

GENERAL HINTS ON MANURING

Cultivation in the fruit garden consists chiefly of keeping down weeds and attending to pruning. Manuring is also important. The condition of a tree can often be judged by the appearance of its leaves. If the leaves have brown edges this indicates lack of potash. Brown, dark centres to the leaves show a need for more phosphatic foods, and undersized leaves of pale colour, show a lack of nitrates in the soil. All fruits need lime annually, and a dressing of potash is also advised.

The most popular fruits in cultivation in the small garden are described in more or less detail in the succeeding pages, together with particular hints as to their cultivation.

APPLES (*Pyrus Malus*).—All the apples in cultivation are actually varieties of the common Crab apple. They are probably the most popular of all fruits in the home garden, partly because most varieties can be stored for use as required. They can be grown as ordinary bush trees, or as trained cordons, or espaliers. Standards and half-standards are also obtainable, but these are not so commonly planted, and are not recommended except where an ornamental tree is wanted, for instance, a specimen tree on a lawn.

The best aspect for planting apples (and other fruits) is probably on a slightly northern slope. The reason for this is that frost on the trees in the very early morning is far more harmful if sun shines directly on it, so that it thaws quickly. If it thaws out slowly, frost appears to do little damage. A very low-lying valley is unsuitable for fruit culture of most kinds, but a cold windy hill top is equally unsuitable. If possible, therefore, the site for apples should be on the side of a hill, where there is any preference.

Suitable Soil.—Almost any kind of soil is suitable for apple growing. That is to say any kind of soil can be made suitable. Good drainage is absolutely essential as the roots of apples penetrate very deeply. Very chalky sub-soils are possibly less desirable than gravel sub-soils, but actually any kind of soil, if it is deeply dug and suitably manured to make the upper layer of soil porous and friable, will produce good fruit.

In preparing the soil, old decayed stable manure should be used if obtainable, and a good dressing of lime should be given to *every kind of soil* before planting. Chalk is a form of lime that is best suited to gardens where the soil is light and sandy.

The distance apart for apples is according to the type of tree used. Cordons on walls or along side paths are planted 2 ft. apart; espaliers are planted 14 ft. apart against walls; bush trees are planted 10 to 12 ft. apart. (Standards and half-standards would need more room.) Planting should be done in the manner already described, and the trees staked immediately, whatever their kind.

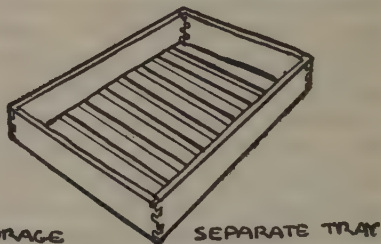
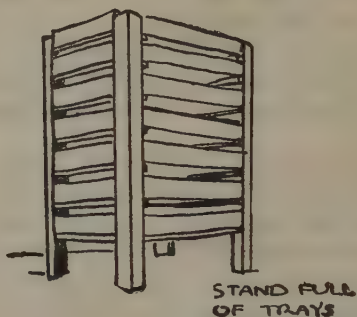
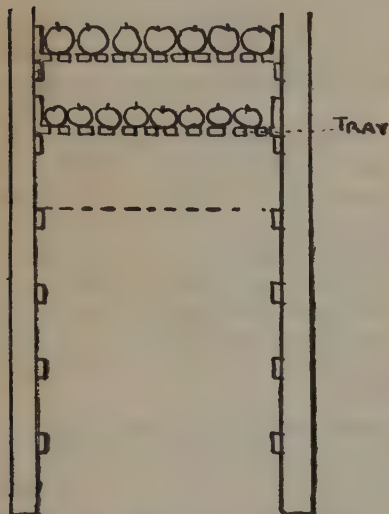
General Cultivation.—A newly-planted apple tree is most likely to suffer from the effects of long drought, and to avoid this, a mulch of well-rotted stable manure should be spread over the soil surface round each tree. This also ensures that the tree has a good supply of plant food, so that it makes rapid growth the first season. Stable manure after the first year, is given as required, an annual dressing being usually desirable, until the tree is fully grown.

Regulate Food Supplies.—The feeding of apples can be taken as typical of the use of fertilizers all over the fruit garden. The tree must be examined each year to see what amount of new growth it makes, and how it fruits. If a tree makes a large quantity of new stems of healthy appearance, but does not fruit well, it is a sign that it is well supplied with nitrogenous food, but not sufficiently supplied with phosphatic food. If, however, the trees fruit well but make very little new growth, stable manure may be given liberally as this supplies a considerable quantity of nitrogen, and thus promotes the formation of leaf and stem. *All apples should be given a dressing of potash annually.* It is an essential fertilizer for this fruit, and *sulphate of potash* at the rate of one ounce

per square yard, or four ounces for each well-established tree, should be applied to the soil annually. It can be given in the form of kainit in November, or pure sulphate of potash (i.e. purified kainit) in spring.

Pruning.—When a young tree is supplied from a nursery during the winter months, it is probable that no pruning is required that season, since any that needs to be done will have been done in the nursery. The second winter it should, however, be pruned fairly drastically. As regards subsequent pruning the point to remember is that hard pruning

STORING FRUIT



SECTION OF STAND FOR FRUIT STORAGE

SEPARATE TRAY

Fruit stored in wooden trays through which air can circulate freely will keep much longer than badly stored crops

induces vigorous growth. Light pruning only is practised when the tree is growing well, and more fruit then results.

All that the novice needs to do in order to understand the instructions for pruning, is to distinguish between leaders and side shoots, and between fruit and leaf buds. Leaders are the main branches of a tree, that is to say, they are the top, newly-grown parts of these main branches. The side shoots or laterals are the other growths that come from these branches, and these are for the most part pruned back so as to leave the tree with, as it were, a number of cordon stems, radiating from the main trunk.

THE FRUIT GARDEN

Winter pruning consists in cutting the laterals back to about an inch or two from the old wood. This leaves about four or five buds on the lateral growth. Some of these will develop during the growing season into fresh lateral growths, but some should swell into fruit buds. A fruit bud is, of course, fatter and rounder than a leaf bud.

Pruning in later years consists in repeating this operation, always *leaving the fruit buds and one or two other buds on the laterals*, but cutting away the unwanted ends of the laterals. The leader is treated according to whether an extension of the tree is wanted or not. If the tree is growing healthily, some of the main branches are allowed to remain nearly full length, only the tips being cut off during the winter pruning. When the tree has attained full size the leaders are cut back more severely. The difficulty with apples is that some apples tend to produce fruit buds on the tips of the laterals instead of at the base, near the old wood. As a rule, shortening the laterals in the way described induces the formation of fruit buds near to the old wood, but where these do not readily appear, the laterals are best pruned more lightly, leaving about six buds on them. Fruit buds that are observed at the tops of stems at pruning time are, of course, allowed to remain.

Varieties.—The choice of varieties in planting a small fruit garden is rather important, because unless the blossom of each tree can be pollinated, no fruit will set. In some cases the flowers cannot be pollinated unless there is a different variety of the same fruit in flower at the same time. For instance, a Cox's Orange Pippin apple, grown as a single specimen in a garden with no other apple trees near, will crop very poorly, if at all, as this variety is *not self-fertile* (i.e. fruit will not set if the pistil is only pollinated with pollen from its own flowers).

Almost any good catalogue gives full particulars of the varieties which are self-fertile, or non-self-fertile, and the amateur grower is advised to plant, for the most part, the self-fertile kinds, or to be quite certain that he is planting two that will pollinate each other. Self-fertile varieties of apples suitable for planting as single specimens, include "Irish Peach," "Rev. W. Wilks," "Lord Derby," "Laxton's Superb" and "Laxton's Epicure."

If a fair-sized fruit orchard is being planned, and a dozen or more varieties are grown, some effort should be made to arrange for a succession of fruit. For instance, "Irish Peach" is ready for gathering in August, but it is not a good apple for keeping. "Laxton's Epicure" is an early apple which would follow "Irish Peach"; "Golden Russet" would come still later and "Laxton's Superb" later still. Another important point is to consider the use to which the fruit is to be put. If apples are wanted for home consumption, those of specially good flavour should be chosen, such as "Cox's Orange," and "James Grieve," or "Laxton's Epicure."

The following brief description of some of the most popular apples will help the amateur to select good varieties:

ALLINGTON PIPPIN.—Dessert; Oct.-Dec. Medium, conical, lemon-yellow flushed and striped with bright red; flesh very juicy and crisp with brisk flavour; very vigorous, and a reliable cropper. Light pruning is desirable. Pollinates with Worcester.

BEAUTY OF BATH.—Dessert; early Aug. Small, flat, striped and spotted; flesh soft, brisk flavour; neat growth, prolific; much grown for market but good enough for early dessert; gather rather before ripe and store in cool place. Self-sterile. Apt to drop its fruit before quite ripe.

BLenheim ORANGE.—Culinary or dessert; Nov.-Feb. Large, even shape, golden yellow with red cheek and russet; flesh firm, characteristic flavour. Takes some years to become profitable. Pollinates with Bramley.

BRAMLEY'S SEEDLINGS.—Culinary; Nov.-Jan. Very large, flat, green, dull red cheek, acid, cooking frothy; spreading vigorous habit; extremely prolific and the most reliable cooking variety; succeeds on damp and heavy soils and also on dry ones. Partly self-fertile. Pollinates with Blenheim.

CHARLES ROSS.—Exhibition and dessert; Oct.-Nov. Very large, fertile, rather upright in growth. Does well on chalk sub-soils.

COX'S ORANGE PIPPIN.—Dessert; Nov.-Mar. Medium, round, orange shaded and striped dull red; flesh soft, very juicy, and of rich flavour; growth and fertility moderate. Self-sterile. It is advisable, therefore, to interplant with Bramley's Seedling, Worcester Pearmain, or Grieve.

DUKE OF DEVONSHIRE.—Dessert; March-April. Small, round, yellow with russet; flesh crisp and finely flavoured; hardy and fertile.

ELLISON'S ORANGE.—Dessert; Oct. Medium, similar in shape and colour to Cox's Orange; flesh tender, yellow, sweet and of good flavour. A cross between Cox's Orange and Calville Blanc. Does very well in the Midland and Northern Counties.

GRENADIER.—Culinary; Aug.-Sept. Large, conical, pale green to yellow, moderate grower, regular cropper; an excellent early codlin. Cooks to a froth.

IRISH PEACH.—Dessert; Aug. Small, flat and slightly angular, pale yellow with pretty stripes; flesh soft, juicy, very highly flavoured, fertile. Prune lightly.

JAMES GRIEVE.—Dessert; Sept.-Oct. Medium, even in shape, lemon-yellow, striped red; flesh tender, very juicy, of remarkably high flavour; growth vigorous, compact, reliable bearer.

LAXTON'S EPICURE.—Sept. Medium, round, pale yellow with crimson flush and stripes. Flesh yellowish, very tender.

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LAXTON'S EXQUISITE.—Sept.-Oct. Fairly large, round oval, yellow, with strong red flush and stripes, flesh tender, very good flavour. Growth good, rather upright.

LAXTON'S FORTUNE.—Dessert; end Sept. Size medium, yellow, flushed and streaked with red, flesh sweet and juicy, highly flavoured. One of the best of the newer apples.

LAXTON'S SUPERB.—Dessert; late. Medium, round, flattened, golden yellow with red flush; flesh crisp, sweet and aromatic; very prolific.

NEWTON WONDER.—Culinary; Dec.-May. Medium, round and even, beautifully striped and flushed; flesh crisp and acid, vigorous and hardy; one of the best cooking varieties for orchards or gardens. Interplant with Lane's Prince Albert. Liable to silver leaf in some districts.

REV. W. WILKS.—Culinary; Oct.-Nov. Very large, flat, even; pale yellow; extremely fertile, dwarf habit; good cooker.

WORCESTER PEARMAIN.—Dessert; Sept. Medium, conical, entirely covered with scarlet; flesh very juicy, crisp and remarkably sweet; habit compact, very regular annual bearer. Partly self-fertile. Pollinates with Allington.

APRICOTS (*Prunus armenaica*).—Apricots are cultivated like plums, with the exception of the fact that they are natural dwellers of dry soils. If, therefore, an apricot is growing in a garden where rain soaks frequently down to the roots, it does not succeed well, as excessive rains cause excessive growth which is detrimental to fruit production. The common practice in such a case is to lay sheets of asbestos, or galvanized iron, over the soil surface near the stem of the tree. This, accompanied by very careful attention to drainage before the tree is planted, will encourage fruitfulness.

One of the best varieties for growing in the small garden is *Breda*, the fruit of which ripens in the middle of August. (See also Plums.)

BLACKBERRIES (*Rubus fruticosus*).—It may not be desirable in the very small suburban garden to grow blackberries, except where they are in special demand. The newer blackberries such as the "Himalayan Giant" and "Edward Langley" are exceedingly prolific, and very decorative, and are admirable for growing trained to wires as fences. They make enormous growth, however, and must not be planted nearer than 10 ft. apart. The "Himalayan Giant" blackberry will actually cover 20 ft. of fence when once established, and fruit enormously season after season.

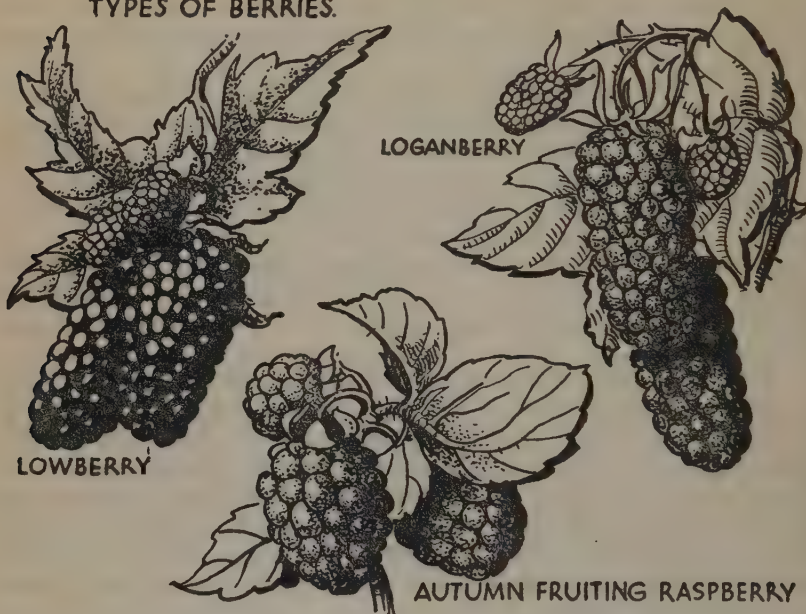
Blackberries should be planted in a situation where the soil is not likely to dry out, and given a good mulch of manure each spring so that they do not suffer from drought. Other culture consists merely in keeping them tied to their supports, which need constant attention,

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and in cutting out most of the old wood after the canes have flowered and fruited.

The "Himalayan Giant" blackberry will fruit again on old wood, but as it grows so prolifically, it is really best to cut out the old wood entirely each season, and only train in the new growths.

TYPES OF BERRIES.



Climbing fruits are very useful for screening ugly fences and can be grown in very limited space

Increase of stock can be obtained by simple layering. (See CHAPTER XVI.)

BULLACE (*Prunus insititia*).—Bullaces are not often grown in small fruit gardens, though several varieties are obtainable. They are treated in exactly the same way as ordinary plums.

CHERRIES (*Prunus cerasus*, Wild Cherry. *Prunus avium*, The Gean).—Cherries grow to perfection on the chalky hills of Kent, indicating that their roots like to get down into very well-drained, chalky soil. Preparation for cherry planting should, therefore, be thorough. An important point in planting this fruit is to examine the roots carefully, and also the stems, cutting clean away any that are damaged in transit from the nursery. This is necessary because, like all the stone fruits, cherries are susceptible to disease if damaged wood is left.

THE FRUIT GARDEN

Standard trees are planted 24 ft. apart, bushes 15 ft. apart, cordons 2 ft. apart. Fan-trained Morello cherries (which are suitable for walls facing north) occupy about fifteen feet of wall space.

Pruning is almost unnecessary with most cherry trees, though in the early stages it may be advisable to cut out a little of the feathered growth, weak stems and so on, so as to encourage the formation of long shapely main branches.

In choosing varieties of cherries, succession should be kept in mind as in the case of apples. No self-fertile sweet cherries are known, and it is therefore essential to plant more than one cherry tree unless other cherry trees are grown in neighbouring gardens. A few useful cherries that can be planted in pairs, to pollinate each other, are as follows:

"Bedford Prolific," a dark red early July-fruiting cherry, with "Napoleon Bigarreau," the fruit of which ripens in August. The Napoleon is brilliant scarlet and yellow, and bears enormous sized fruits.

"Frogmore Bigarreau," July, yellow and red fruit, with "Early Rivers," which is ready for gathering at the end of June. Black fruits.

"Napoleon Bigarreau" with "Elton Bigarreau," which fruits in early July, with fruits much the same colour as the Napoleon.

If only one cherry tree can be grown, the best is probably "May Duke," which is partly self-fertile, and will produce some fruit even when grown unaccompanied.

CURRENTS, BLACK (*Ribes nigrum*).—Black currants are planted 5 ft. apart each way in soil which has been deeply dug and well manured. They like plenty of moisture in the soil, and fruit well in riverside gardens where floods occur during winter. In districts where Big Bud is prevalent, only immune varieties should be grown, as though it is possible to treat Big Bud by applications of lime sulphur, it is far better not to have the worry of this pest in the garden.

General culture of black currants consists in keeping down weeds and in regular systematic pruning. This is done immediately after the plants have fruited, all the old fruiting wood being cut out and only the strongest of the new developing stems allowed to remain. Crowded weak growths should be removed at this season, and also again in winter, if they have appeared in the interim.

Black currants can be increased easily by inserting cuttings six inches long, close together, in rows in sandy soil in November. No cold frame or propagating frame is required.

Some of the best varieties for the amateur's garden are "Seabrook's Black" (immune), heavy cropper, long season, "Boskoop Giant," early fruiting, and "September Black."

Black currants grown on stiff soils can be treated with a mixture of four ounces of basic slag, and one ounce of kainit, to each bush, applied

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in early winter. In spring this will be followed by an ounce of sulphate of ammonia to each bush. On light soil it is better to use the following mixture, applied in late winter: Two ounces superphosphate of lime, one ounce of sulphate of ammonia, one ounce kainit.

CURRANTS, RED (*Ribes vulgare*) **AND WHITE** (*Ribes vulgare album*).—These are also planted 5 ft. apart each way, unless cordon varieties are being grown. Cordons are not, however, advised for the ordinary garden, because of the extra trouble in keeping them to the trained shape.

On stiff soil, red currants can be dressed with basic slag from four to eight ounces per bush in late autumn, and in winter they will appreciate a dressing of two or three ounces of kainit to each bush. On chalky soil it is better to use superphosphate of lime at the same rate of kainit, in early spring, in the place of the basic slag.

Pruning consists in cutting back the main stems, cutting out all weak and broken stems, and then cutting back the side shoots on the remaining main stems so that each is like a cordon. Three or four buds on each lateral growth are sufficient to leave. The red and white currants fruit on the old wood in the same way as apples, and not on the new wood as do black currants.

Good varieties for the amateur's garden are "White Dutch," "Red Dutch," heavy cropper and "Raby Castle," large fruit.

DAMSONS (*Prunus communis*).—Damsons are sometimes grown as shelter belts of trees along the most exposed side of a fruit orchard. They are extremely hardy and fruit regularly. The damson will, however, usually give place to the plum in the small garden.

The Merryweather damson is one of the best for all purposes. (Cultivation as for *Plums*.)

FIG (*Ficus carica*).—This is best grown in poor soil, such as gravel. Mortar rubble or chalk should be freely added to garden soil before planting.

The fig grows three crops of fruit a year. In this country only one matures, that is, the last of the three. Fruits are formed in autumn and mature the following summer. Any large fruits seen on the trees in September should be removed. No other pruning is needed.

Under Glass figs are grown in large pots. The variety "St. John" placed in bottom heat in late October, will produce fruit in March.

The best variety for outdoors is "Brown Turkey," which is also grown under glass.

GOOSEBERRIES.—These are planted 5 ft. apart each way, like the currants. Gooseberries are not very particular about sunshine, and are very suitable for growing in gardens that are inclined to be shady. They succeed very well under tall standard trees, and in similar positions.

THE FRUIT GARDEN

Give an annual mulch of manure in May and light dressings of sulphate of potash in spring. Increase by cuttings in the same way as black currants.

Some of the best varieties are "Lancashire Lad" (red), "Whitesmith" (white), not liable to mildew, "Keepsake" (green), and "Golden Drop."

Lancashire Lad is the best variety for garden culture.

If cordon gooseberries are grown, "Lancashire Lad" is a good variety.

The "Worcester" berry is a big bud gooseberry, with a slight black currant flavour, due to its parentage. It is worth growing as a novelty.

GRAPE VINES.—Grape vines are grown in this country both outdoors and under glass. Those grown outdoors are usually regarded more as ornamental features of the garden than as fruit bearers, although in some favourable districts, and where plenty of sunshine reaches the vine, heavy crops of small fruits can be obtained from outdoor vines. The pruning of the vine to encourage fruit production does not in any way detract from its beauty as an ornamental feature on a wall, and those who have vines already established would do well to study the methods of pruning applicable to this fruit. The grapes themselves, when ripening, are very ornamental.

It is very important in growing grape vines under glass to prepare the soil of the border. The soil must be dug to a depth of $3\frac{1}{2}$ ft., and a layer of broken clinker and brick bats, fine ash and mortar rubble laid at the bottom. The thickness of this layer should be about 6 in. It is quite possible to grow good grapes from a vine planted outside the greenhouse with its stems entering the greenhouse.

The soil used should be a good rich friable loam, cleansed of all pests. To each barrow-load, a pound of bone-meal and a large potful of mortar rubble is added. Course sand should also be added to heavy soil, but no ordinary stable manure should be used.

Grape vines are planted in October, and if more than one is grown, a distance of at least 5 ft. should separate each plant.

In heated greenhouses where dessert grapes are grown, the temperature should be kept at about $40-45^{\circ}$ in winter, and increased gradually in spring until the flowers appear, when it will be about 60° . Ventilation should be as free as possible, but care must be taken that draughts do not enter on the windy side.

Grapes are syringed freely while the buds are breaking. Moisture is so important at this juncture that if buds do not develop properly, growers frequently tie damp moss over them to encourage them. When the fruits begin to colour, syringing ceases, and more ventilation is given. A thorough soaking with water once a week is better than frequent small doses from a water-can.

The amateur grower is recommended to purchase his fertilizers for

vines ready-mixed, as these are prepared with great care, are well-balanced, easy to handle, and clean and efficient in use.

Pruning.—It is in the pruning of a grape vine that most amateurs find difficulty, but the pruning principles are quite simple, and can be readily understood by a novice. The vines are restricted to one or more main branches. Large lateral branches are allowed to grow at regular intervals, other buds being rubbed away in the early stages.

Each of these lateral branches is kept free of side stems, apart from short growths which should carry the flowers and fruit. Pruning usually consists in cutting back the side shoots from the lateral branches.

As soon as the foliage has dropped, the shoots are cut back to within two buds of the old wood. As the plants come into growth in the spring both buds develop, but only one is allowed to continue to grow, the other bud being rubbed off. Each shoot as it grows is pinched out when three or four leaves have developed beyond the flower bunch. If a shoot does not show a flower bunch (which will appear not far from the main stem), it is pinched out when it has made about eight pairs of leaves.

As the fruits develop they are thinned, using a pair of sharp-pointed scissors, and cutting out enough fruits from each bunch to allow ample room for the development of the remainder.

The chief troubles of grapes under glass are scorching, scalding and shanking. *Scorching* is due to excessive sunshine and can be prevented by shading the fruits during the hottest sunny days. *Scalding* is due to a sudden rise in temperature and stricter attention to heating and ventilation will remedy this. *Shanking* is the term given when the stalks of the fruits shrivel up before the fruit matures. This may be the result of watering with excessive cold water, or it may be, in the case of vines which are grown outdoors, due to irregular weather conditions. The best variety for planting in the amateur's greenhouse is "Black Hamburg."

The pruning of outdoor vines grown as ornamental coverings for walls, is done on much the same lines as those suggested for indoors, but a large number of lateral growths and longer growths are allowed to remain on the vine during the summer so that the wall is completely covered. Winter pruning (i.e. in January) consists in cutting these back like those of the fruiting vines.

LAXTONBERRIES.—Laxtonberries are a hybrid of somewhat similar character to Loganberries. They appear to be rather less prolific than the Loganberry, and are therefore not to be recommended where only one kind can be grown.

LOGANBERRIES.—Loganberries are believed to be a cross between the blackberry and raspberry, but their origin is somewhat obscure. All that is known is that they were first discovered in the garden of Judge Logan.

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Like the Himalayan Giant blackberry, they like ordinary good rich soil, well supplied with moisture, and benefit from an annual dressing of stable manure. They are treated in exactly the same way as the Himalayan Giant blackberry, that is, the old canes are cut away after fruiting and new ones tied in their place.

MULBERRY (*Morus nigra*).—This is a deciduous tree which grows up to 30 ft. in height. A light, rich, moist loam suits it best. No pruning is necessary other than that usually given to ornamental trees in the garden, that is, enough to keep the tree shapely by pruning during the early stages.

If it is desired to increase the stock, a branch can be cut off in autumn and put into some light soil, where it will probably root. Or layering may be done in spring.

NECTARINES (*Prunus persica*).—Nectarines are near relatives of peaches, and cultural instructions given for the peach may be taken to apply to the nectarine. They are generally regarded as slightly more hardy than the peach, and more suitable for the open garden. (See PEACH.)

NUTS. Cob-nuts (*Corylus avellana*).—Are excellent fruits for inclusion in the garden where the soil is rather poor; they should be more commonly grown than they are.

No special cultivation is needed beyond the ordinary soil preparation before planting.

Walnuts (*Juglans*) should also be more common. There are two kinds in commerce: the common European walnut that has been grown here for centuries (*J. regia*) and a newer dwarf walnut (*J. praepecturiens*), which comes into bearing much younger. Walnuts succeed on any soil, and are excellent for town gardens.

PEACH (*Prunus persica*).—Peaches require a sheltered corner of the garden, and if they can be grown as wall fruits they are more likely to succeed in midland and northern gardens than if they are in a very exposed position. Fan-trained trees can be planted 15 ft. apart. They should be planted in well-prepared soil.

Pruning.—As the fruits appear on the young wood of one year old only, it is necessary to keep the tree well furnished with young shoots. During the growing season, the majority of new young shoots are pinched out, leaving only the two strongest at the base of each fruiting stem. One new shoot is also left at the extremity as this practice encourages the sap up beyond the fruit. After the fruit has been gathered, the shoot is cut carefully back to the point just above the two new shoots that were left at the base. These are the fruiting stems for next season.

The best varieties of peaches and nectarines for outdoor culture are:

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Peaches.—“Bellegarde,” “Dymond,” “Hale’s Early.”

Nectarines.—“Early Rivers,” “Lord Napier.”

PEARS (*Pyrus communis*).—Pear blossom opens early, and is somewhat tender, so that if possible a position sheltered from east winds should be chosen.

Pears succeed only on good rich loam. In ordering pears from a nursery, it is always best to tell the nurseryman what the garden soil is like, as pears on pear stock are more suitable for light soil, while those on quince stock are better for heavy soil.

Standard pears are planted 24 ft. apart, half standards 15 ft. apart, bushes 10 ft. apart, espaliers 15 ft. apart, and cordons 2 ft. apart.

Pruning of pear trees is done in much the same way as already described for apples. As a rule, however, pruning is less necessary with the pear than with the apple, as the trees often seem to make cordon-like branches naturally, without any assistance from the gardener. In any case it is a mistake to prune too severely while the trees are young.

Fertilizers can be supplied as for apples, and stable manure also given according to the amount of stem and leaf growth made each season.

Lime is a very important fertilizer here as in all parts of the fruit garden. A dressing of nitrate of soda just before the flowers open, often helps to produce quantities of good fruit.

Some of the best varieties of pears for the amateur are described as follows:

BEURRE D’AMANLIS. September; large yellowish green, bronze cheek with small russet patches; excellent cropper as pyramid or standard.

BEURRE D’ANJOU. November-December; large yellow green, slight brown flush; flesh white, melting, with delicate perfume; growth weak, requires a wall or warm corner.

BEURRE DIEP. October-November; very large, yellow, covered with conspicuous brown dots; flesh tender, vigorous, fertile, of good flavour when well grown on quince; requires a wall in colder climates.

BEURRE SUPERFIN. October-November; golden yellow covered thin cinnamon russet; flesh melting, of delicate perfumed flavour; growth moderate, fertile.

CATILLAC. December-April; large, roundish, dull green with brown red flush; flesh firm, cooking well; makes an irregular pyramid on quince, but fruits early; succeeds as a standard, and on north and east walls. One of the best cooking pears.

CONFERENCE. October-November; medium, very long-necked, dark green, with brown russet, flesh of pinkish tinge; vigorous and most regular cropper. Good where only one pear can be grown.

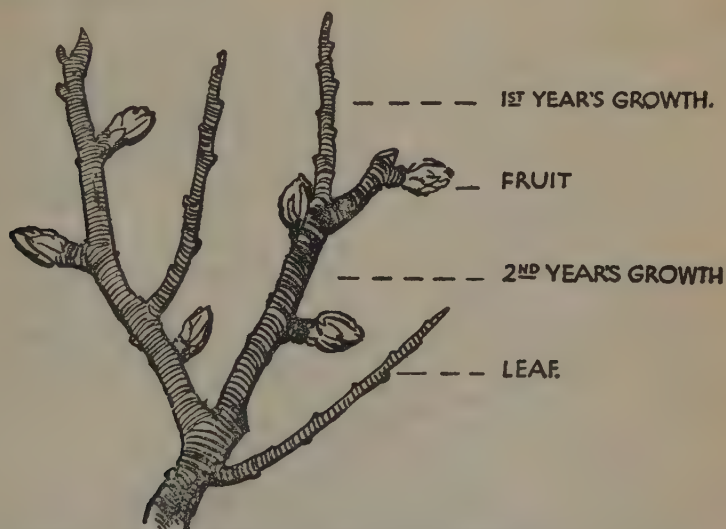
DOYENNE DU COMICE. November; large, pyramidal, lemon yellow,

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with slight russet; flesh yellowish white; growth vigorous and moderately fertile.

LAXTON'S SUPERB. August; large, flesh very tender and deliciously flavoured.

LOUISE BONNE OF JERSEY. October; medium, smooth, yellowish-green, with dark red flush and covered prominent dots; flesh white, melting and of distinct flavour.



BRANCH OF PEAR TREE SHOWING DIFFERENCE BETWEEN FRUIT AND LEAF BUDS.

The object of pruning is to promote the formation of fruit spurs, to make a shapely tree that will admit light and air to all branches

PITMASTON DUCHESS. October-November; enormous, golden yellow, with slight cinnamon russet; flesh yellow, tender, juicy and highly flavoured in good seasons; growth vigorous, fertile; not recommended for standards.

WILLIAMS' BON CHRETIEN. September; medium, yellow with russet dots and faint red streaks; flesh white, fine grained, melting, and of strong musky flavour; growth vigorous, fertile.

Pears need special care when they are gathered. They are best not allowed to turn colour on the trees, but should be gathered just before they ripen. It is also a useful practice to gather them in batches from the same tree, say at intervals of three or four days, as those that are gathered ripen rather quickly, and the fruit is available by this method for a longer period.

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The very late-fruited pears need plentiful sun before they are gathered and should be left on the trees until the end of September.

PLUMS (*Prunus communis*).—Plums are a very useful fruit for small gardens, but some varieties are very regular in fruiting while others are rather erratic. The *Victoria Plum* and *Coe's Golden Drop* are two of the best in this respect.

Greengages are apt to be damaged by frost. They are not self-fertile and should therefore only be grown when other varieties of plums are present. Ordinary good, well-drained soil is required for plums, and trees that are bearing well benefit from a good mulch of stable manure each year. Lime is particularly important in the case of plums and all other stone fruits and so also is a dressing of phosphatic manure each year, such as basic slag in the autumn or superphosphate in spring (4 ozs. per square yard in each case). Kainit can be applied at the same time as basic slag (2–4 ozs. per square yard).

Plums, like cherries and apples, are some of them self-fertile and some self-sterile. The following pairs are satisfactory for the small garden where not many varieties can be grown: “Coe's Golden Drop” with “President.” The Golden Drop is a self-sterile yellow dessert plum, ripe at the end of September; and President is a cooker, dark purple, ready for gathering in October. “White Magnum Bonum,” a cooking plum of pale creamy yellow, is also suitable for planting with “President.”

Other useful varieties of plums for the amateur's garden are as follows:

EARLY TRANSPARENT GAGE (*Early Apricot*). Dessert; early August. Medium, roundish apricot yellow, with crimson spots. Self-fertile.

GOLDEN TRANSPARENT GAGE. Dessert; early October. Very large, golden yellow. Self-fertile.

OULLINS GOLDEN GAGE. Early August. Large oblong, pale yellow with light bloom; flesh firm and very sweet; growth robust. Self-fertile.

PERSHORE. Culinary; August. Medium, oval, yellow, with white bloom; adhering to stone. Self-fertile.

POND'S SEEDLING. Culinary; mid-September. Very large, oval, very dark red with blue bloom; growth vigorous and spreading. Self-fertile.

PURPLE PERSHORE. Culinary; mid-August. Medium, oval, purplish red. Very vigorous. Self-fertile.

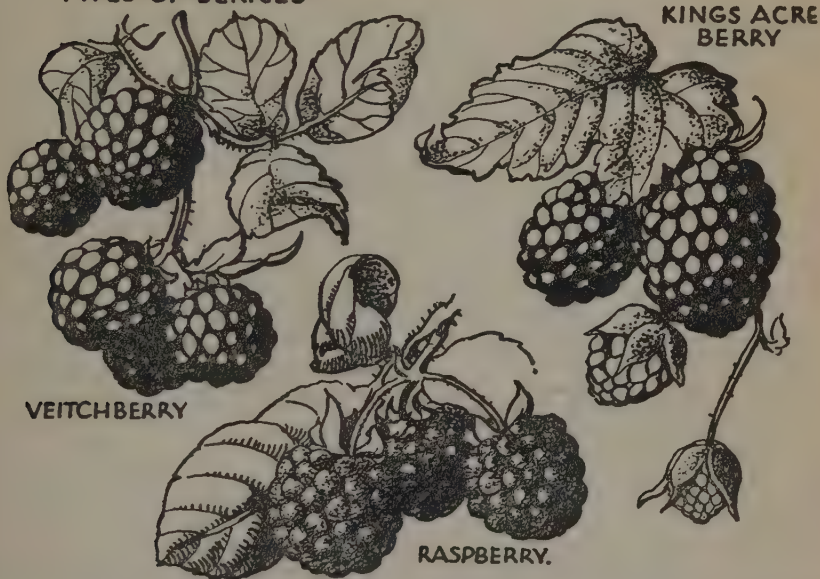
QUINCE (*Rosaceae*).—Several varieties of quince are grown for fruit and many of the ornamental varieties which are recommended for shrubberies in large gardens also bear fruits which can be used for preserves. They appreciate damp soils and can be planted on the margins of ponds. They will also succeed in any ordinary, well-dug garden soil.

Almost no pruning is necessary with this fruit.

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RASPBERRIES (*Rubus idæus*).—Raspberries are one of the most valuable of all fruits in the home garden; in fact, they may be considered *the* most valuable. The reason for this is that raspberries in good condition are practically unobtainable from shops. By the time the raspberry has been gathered, packed, transported from market to market, and then redistributed to consumers, it has lost a good deal of its freshness.

TYPES OF BERRIES



Many new types of berries have been introduced lately. They all enjoy rich soil, especially bone-meal and good drainage

Moreover, if the fruit has to be gathered for transport in this way, it cannot be left to ripen on the canes, but must be gathered almost before it is ripe, and this again prevents the finest flavoured fruit from reaching the private household. Still a third reason why home-grown fruit is best is that certain varieties of raspberries which have the finest flavour, such as "Park Lane," are too soft in texture to be of any use for market culture. These can, however, be grown in the home garden where they are used immediately they are gathered.

Raspberries are planted in rows 5 ft. apart, leaving about 18 in. between each cane; or groups of three canes, a few inches apart, can be arranged.

Pruning.—With most varieties, pruning consists of cutting out the

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old canes each season after the fruit has been gathered, cutting them right down to the soil level and leaving only the new canes that are springing up to bear the next season's fruit. A few varieties are called "Autumn fruiting" Raspberries, and these can be cut to the ground each spring instead of each autumn. Fruit will then be produced on canes of the current year's growth. Of these the chief are "Hailsham," "Lloyd George," and "November Abundance." "Lloyd George" is probably still the best variety of Raspberry for general cultivation, and can be treated either as autumn or spring fruiting. As a matter of fact, in many gardens, this variety keeps a supply of fruit all the season.

In winter the soil of the Raspberry plantation may be *lightly* forked, and the canes should be tied to wires stretched along the rows. In early spring a dressing of fertilizer may be applied, mixed as follows: 7 lb. superphosphate of lime, 4 lb. kainit, 2 lb. sulphate of ammonia, applied at the rate of half a pound to each square yard.

STRAWBERRIES.—Strawberries are another fruit which it is worth while to grow because of the better condition in which the fruits can be obtained as compared with those of the market.

Unfortunately, Strawberries demand a fair amount of attention and occupy a good deal of garden space without being specially decorative, and they are therefore regarded with disfavour by many owners of small gardens. Where a plot can be given over to them, however, they provide one of the finest of home-grown crops.

A good practice in Strawberry culture is to make a plantation in three sections. A Strawberry plant lasts for about three years, after which it can be discarded as worthless. Every year each plant sends out a plentiful supply of runners, on the ends of which grow tiny new plants which root readily in the surface soil. Each of these rooted runners, if potted up in rich soil, will make a new plant. These plants bear most prolifically in the first and second seasons after planting.

To keep a regular supply of fruit, the grower is advised to scrap one-third of his plants every year and replant the bed with newly-rooted runners *taken from the healthiest plants of his collection*. This last point is important, for if a runner is taken from a plant which has not borne fruit, the runner will in turn bear no fruit.

New plants are generally bought in September or in March. They should be planted 18 in. apart in rows 2½ ft. apart. (Strawberries can for a season or two be run between two rows of new Gooseberries or Currants which are spaced at 5 ft. apart.)

When runners appear in the first season they will be taken off, as they weaken the plants. During the second season one good runner can be allowed to develop from each of the plants, to be rooted and used for September planting. It assists the runner to root if the growing

THE FRUIT GARDEN

tip, where the tuft of leaves is forming, is pegged down into the surface soil.

An annual mulch of stable manure and autumn dressings of fertilizer keep the plants healthy. The fertilizers should consist of an ounce of sulphate of potash per square yard applied in autumn and three ounces of superphosphate and one ounce of sulphate of ammonia per square yard applied in spring. A little nitrate of soda may be used after the flowers open, to encourage the formation of large fruits. This is of course applied after the soil has been thoroughly soaked with water or rain. During the three years that Strawberries remain in the bed they need frequent hoeing to keep the soil surface free from weeds (except during the time that straw is laid between the rows).

Some growers, especially where the soil is inclined to be dry, put a good dressing of light strawy manure between the rows quite early in the season. This helps to conserve moisture in the soil and also serves the same purpose as the conventional straw mulch which is laid down just before the fruit ripens.

Some of the best varieties of Strawberries for the amateur are as follows: "The Duke," "King George," "Sir Joseph Paxton," "Waterloo," "Givon's Late Prolific." These will provide a succession of fruit for a long period.

VEITCHBERRIES.—Veitchberries are hybrid berries of the same type as the Blackberry and Loganberry and treated in the same manner. The fruit is of the colour of a Mulberry and a distinctive flavour midway between the Blackberry and Loganberry. Its greatest use is for preserves.

The chief trouble in connection with this fruit is that it attracts the attention of flies, wasps and birds to such an extent that really ripe fruit is difficult to obtain.

FRUIT STORAGE

The storage of apples and pears is an important matter to the amateur fruit grower. Some dessert apples are not ready to eat until spring, and a good many apples are better stored a few weeks before they are ready to eat.

The proper storage trays sold by almost all horticultural sundriesmen are ideal for the purpose. They are made, as a rule, of narrow pieces of wood, between which air circulates freely and the fruits are laid on these in such a manner that they do not touch each other, and are kept in perfect condition.

The storage shed should be from 32–35° in winter; it also should be as dark as possible. A cellar is a useful place in which to store

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fruits in the average household. An attic is sometimes used, but is likely to be less equable in temperature.

If apples are stored for a long period they frequently become rather shrivelled. To prevent this, the apples (after the first week or so, i.e., after they finish "sweating") can be wrapped separately in pieces of oiled paper, which can be bought from any nursery sundriesman. This paper is an added advantage in that it prevents decay spreading from one fruit to its neighbour.

Pears, like apples, should be spread out on shallow trays. Pears are notorious in passing rapidly from the ripe stage to decay. As old farmers used to say, "You have to sit up all night with the pears so as to eat them when they are ripe." In other words, pears in store must be examined more frequently than the apples, to make sure that they are not over-ripe.

FRUITS ON THE SHOW-BENCH

When the amateur gardener intends to show fruit at his local Show, he is not always certain how to stage his exhibit. The following hints may be of assistance in this matter.

All fruits shown should be a little above the average size of the particular variety, and of good colour and form.

Dessert fruits should not be too large, as this is regarded as a fault. Cooking fruits can be very large.

No fruit should be polished before staging, as this rubs off the bloom. Some judges would disqualify polished fruits altogether.

Badly formed fruits, fruits with scab marks, or marks of insects, or other blemishes, should not be staged.

Dessert apples and pears can be staged on dishes, and each variety should be labelled with the name. They can be staged either ripe or unripe, unless otherwise stated in the schedule.

Apricots should be highly coloured, and *peaches* and *nectarines* should also be well coloured, according to the variety.

Grapes should be of uniform size all over the bunch, and should be firm and not either shrivelled or loose on the bunches. The bloom should be dense and undamaged.

Plums should also carry a good bloom and the size should be large for the variety.

Cherries, which should be staged with the stalks, should be fresh; and the stalks also should look fresh on the show-dish.

Black currants can be shown gathered from the bunches or with the bunches intact. *Red and white currants* should always be shown on the bunches, which should be large, while the berries should be clear and brilliant.

THE FRUIT GARDEN

Strawberries and *raspberries*, *loganberries* and *blackberries* should always be shown with the stalk attached.

Tomatoes, if included in fruit classes, should be shown either as single fruits, each with the stalk attached, or can be shown in bunches.

If a mixed collection of fruit is asked for, it is worth while for the amateur to remember that certain fruits carry more weight in the opinion of the judges than others, if the condition of the fruit is identical in each case. The Royal Horticultural Society has laid down the following scale of points to be allowed in each case to a perfect dish of the fruit named. These points would be varied slightly if a mixed collection is asked for, by the fact that some points are given for good arrangement: Grapes, from 10 to 12 points, according to variety. Peaches and nectarines, 8 points. Figs and apricots, 7 points. Pears, apples, plums, strawberries, and cherries, 6 points. Gooseberries, 4 points. Raspberries, 5 points. Nuts, 3 points.

THE YEAR IN THE FRUIT GARDEN

January

Force rhubarb by lifting crowns and replanting under glass in moist, rich soil, or by covering crowns in the open with manure.

Prune soft fruits. Cut out thin *old* shoots from black currants, and thin *young* shoots from red and white currants and from gooseberries.

Burn the prunings, and store the ashes dry to dust among seedlings. If cuttings are wanted, pieces 6-12 in. long, cut below a joint, can be inserted.

Thin out the branches of apples, and any that are overcrowding.

Stake young trees.

Spray with caustic wash to destroy lichen and hibernating insects.

Thin raspberry canes, tie them to supports, and mulch the surface soil with old, decayed manure.

Top dress the soil round loganberries.

Nail up wall-fruits. Prune outdoor grapes.

Spray winter-wash well into the bark of fruit trees. Wear old clothes and gloves. Spray with the wind. Tar Oil washes are easily the most effective.

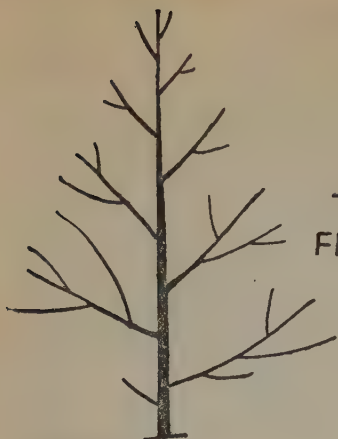
Mulch strawberries with manure.

February

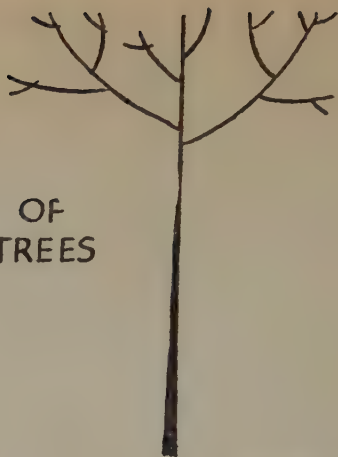
Prepare fish-netting or tiffany to stretch over peach trees to give ample protection. Wall-fruits particularly need this protection.

Weed strawberries. Lightly fork the surface soil and dress with strawy manure.

TYPES OF FRUIT TREES



PYRAMID



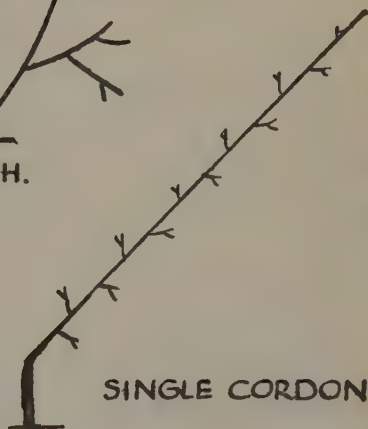
STANDARD



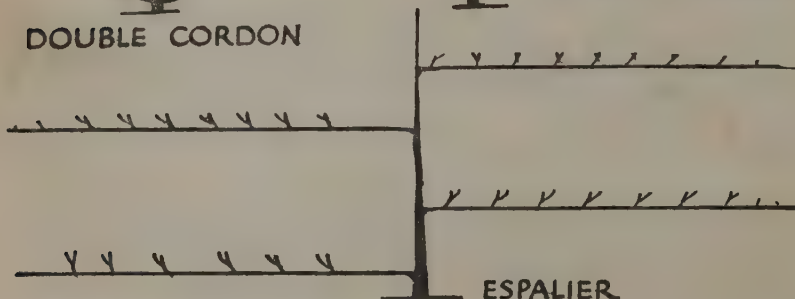
BUSH.



DOUBLE CORDON



SINGLE CORDON



ESPALIER

The various types of fruit trees can be used for different purposes in the garden. Standards make charming lawn specimens, while cordons can be grown in restricted spaces

THE FRUIT GARDEN

Prune currants and gooseberries.

Tie and nail fruit trees grown on walls. Peaches, nectarines, and Morello cherries flower on the young wood, and this should be retained.

Cut away shoots which grow at right angles to the wall, and tie in the side shoots as evenly as possible over the wall surface.

Train loganberries to fences, laying the stems horizontally.

Head back stocks for grafting. Scions should be taken from the parent tree, and placed in the soil under a north wall.

Damsons and quinces are best pruned this month, where required. Damsons make fine shelter screens for other fruits in the small home orchard. They can be planted now.

March

Fruit trees should be planted at once. Give a mulch of well-rotted manure after planting.

Protect apricots and peaches on walls with netting.

Grafting is best done this month.

Make new strawberry plantations.

Limewash fruit trees before the blossoms open, to keep down pests such as green-fly.

Hoe between the fruit trees to destroy weeds and make the soil sweeter.

Gooseberries and currants sprayed with paraffin emulsion will not be attacked by red spider and brown scale.

Cut back autumn-fruiting raspberries to within an inch of the ground and give a top dressing of well-decayed manure.

Summer-fruiting raspberries should be tied to supports.

Stake all standard and half-standard trees. The tying material should pass between the stake and the tree.

April

This is the time for aphid (green-fly) to become troublesome if warm days occur. Spray immediately with paraffin emulsion.

Hoe between all fruits to keep down weeds.

Finish grafting.

New strawberry beds can be made this month.

Pear fruits that appear swelled or "bottled" must be picked off and burned.

Spray apples coming into bloom with lead arsenate to check apple-blossom weevil, codlin moth, and March moth.

Never spray when the blossoms are open; you may kill bees.

Spray black-currant bushes affected with Big Bud, with lime-sulphur mixture every other week.

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Prune figs grown on walls or railings outdoors. Cut out weak or dead wood.

New fig plants can be put in this month, 8 ft. apart.

May

Apricots, peaches and nectarines grown on walls need thinning. The number of fruits left depend on the strength of the tree. Generally it is best to leave one fruit to each sq. yd. of wall.

Watch for the magpie moth or gooseberry sawfly, and if seen, dust the bushes at once with Hellebore Powder, or spray with lead arsenate.

Dress strawberries with superphosphate of lime.

Place clean straw or long strawy manure between strawberry plants to keep the fruit clean. Remove runners not required for making young plants.

All fruit trees on dry ground appreciate a mulch of manure round the roots.

Morello cherries can be disbudded if needed.

Raspberry suckers should be thinned out. Only enough to replace the old canes should be left, unless new plantations are wanted.

Thin gooseberries, leaving the best fruits to ripen for dessert.

Remove grease-bands from standard trees.

Commence summer pruning.

It is best to spray raspberries weekly or more often, while the flowers are opening, to prevent the appearance of maggots.

June

Wall fruits need water at the roots, except in the case of apricots, which appreciate dry conditions.

Cut out from apricots, peaches and nectarines breast wood. Syringe the leaves morning and evening with insecticide to keep off insect pests.

Protect cherries and other wall fruits, and also strawberries as they begin to ripen by the use of fish netting.

Gooseberries should be thinned out, and only a few of the choicest fruits left on each bush.

Strawberry plants are at their best the first or second season according to the time of planting. A good plan is to remake a third of the strawberry plantation yearly, pegging down one or two of the best runners from each plant. Pot them in 3-in. pots later.

The site of the early potato crop is a good place for a new strawberry patch.

Loganberries appreciate a mulch of manure round the roots. They need plenty of moisture, and repay generous feeding.

THE FRUIT GARDEN

All large trees require mulching. Remove superfluous growths, and over-vigorous shoots cut back.

Heavily-laden trees will need support.

Watch for green-fly and spray immediately it appears.

Young side shoots of red and white currant bushes must be pinched back.

All surplus and weak raspberry canes should be pulled out.

July

Remove surplus shoots from fruits of all kinds.

Espalier and cordon trees must be summer-pruned, or they will lose their shape. Cut back the shoots to induce the formation of fruiting spurs.

"Bud" fruit trees this month in the same way that roses are budded. Trees grown from pips or stones are usually worthless until they have been budded.

Pears should be examined. Fruits that appear unhealthy should be removed and only the best allowed to mature.

Strawberries require constant attention. Cut away runners not wanted. Layer others. Clean up the beds, and take away to the bonfire the straw that remains on the surface.

Mulch and water wall-fruit trees.

If apples are too crowded on the trees, thin to two or three at each joint.

Protect soft fruit from birds by netting stretched over a framework of wood.

Dress stone fruits with sulphate of potash.

Moisture is necessary for the development of all fruits. In dry weather hoe between soft fruits, standards, and bush trees every week.

Be careful when gathering soft fruits not to damage the bushes.

August

See that sheds and trays are ready for winter storage of fruits.

Strawberries of early fruiting varieties planted on a south border will produce very early berries.

New strawberry plantations can be made where potatoes have been lifted.

Wall fruits make abundant growth at this season. Tie in young wood wanted for next season, and remove the rest. In very dry weather give an occasional soaking with water, followed by liquid manure.

Gather apples *when they break easily from the tree on being lifted in the palm of the hand.*

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Keep an eye open for the eggs of the lackey moth. This moth deposits eggs in a "bracelet" round young fruit stems. They should be crushed and destroyed.

Take stock of bush and standard trees. Note the amount of new leaf and stem on each. If a tree continually makes exceptionally strong growth, but never has much blossom, dress it with basic slag after the fruit is gathered.

Wall fruit should be protected from wasps and birds, and exposed to the sun as much as possible.

Continue summer pruning. Fruit trees may still be budded.

Late apples, pears and plums may need to be thinned out.

Loganberry and Raspberry canes that have borne fruit should be cut down to the ground level. Tie the new canes to supports to prevent breakage in the wind.

September

Clean up the orchard, and hoe the soil between young trees and soft-fruit bushes.

Prepare grease-bands and put them round fruit trees.

Prepare sites for new trees. Deep trenching is essential.

All early varieties of apples and pears must be gathered.

Sweet Cherries need little or no pruning. Cut away crossing shoots on standard trees, and spur back those shoots which are too crowded.

Red currants and gooseberries should have all side-shoots pruned back.

Basic slag, superphosphate of lime, kainit, sulphate of potash, bone-meal, and lime should be ordered for application in winter.

October

Trench all land intended for fruit-growing and add lime in moderation.

Planting fruit trees. The fine roots should take hold of the soil before the cold months of winter.

Watch for signs of diseased trees. Canker should be cut right out and burnt.

Gooseberry and currant cuttings can be planted at any time now in sheltered positions.

New plantations of raspberries can be made from suckers detached from old plants, planted 3 ft. apart each way. Keep the soil hoed between the roots.

Apricots, cherries, currants and gooseberries should be pruned this month.

Cut out old fruit, leaves and the naked old wood of figs to make room for the new shoots.

Loganberry stems which have borne fruit should be cut to ground level if not already done. Space out the new stems well in retying.

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Strawberry runners should be removed from the plants.

Cut out all weak and useless canes from outdoor vines and shorten the good ones to two or three buds from the base.

Untie wall fruits and wash the walls with soft soap, sulphur and paraffin. Replace the fruits with fresh ties and nails.

November

Plant currants and gooseberries now, after thorough preparation of the soil. They thrive best and give the finest results in rich well-drained loam. Early and late varieties should be planted to give a succession of fruit.

Cut away old wood from black currants, leaving stems of one season's growth only for next year's fruit.

Dress all fruits with kainit (except strawberries).

Figs on walls can be thinned out.

Spread short strawy manure between the rows of strawberries.

Prune all orchard fruits as soon as possible.

December

Prepare the ground for new fruit trees. Planting can only be done during mild spells.

Cut down newly-planted grape vines to within 12 in. of the soil

Spray tree trunks with tar oil winter wash.

Prune and re-nail wall fruits.

Order new fruit trees.

Dress with winter fertilizers as required. All orchards appreciate an annual dressing of lime, enough to whiten the soil surface.

CHAPTER XII

THE VEGETABLE GARDEN—SALADS—CROP ROTATION—POPULAR VEGETABLES AND HERBS, WITH CULTURAL AND EXHIBITION HINTS.

THE VEGETABLE GARDEN

EVERY amateur gardener likes to grow his own vegetables. In every garden large enough to allow about ten rods for the cultivation of vegetables and salad crops, sufficient supplies could be raised to make the average family of four or five persons independent of the markets all the year round. Unfortunately, however, the majority of home gardens are not large enough for this, and the amateur gardener is faced with two alternatives. In certain districts he may be able to rent or buy an allotment within reasonable distance of the home garden, and to cultivate his vegetables and possibly his fruit there. On the other hand he may have to limit his vegetable growing to those crops which are most worth while.

Assuming that he decides to use a part of the home garden, he must first of all plan the position of the vegetable section.

Choosing the Site

The site chosen should preferably be in a sunny position. A slight slope to the south is a distinct advantage. However, any site not overshadowed by trees will do. A few vegetables will grow between small deciduous trees such as young fruit trees, but the *drip* of trees is ruinous to most crops.

The greater part of the vegetable plot is re-planned every year, but a certain amount is of permanent character. Asparagus and Globe Artichokes are permanent inhabitants of the garden, and the selection of a position for such crops is of first importance.

Another feature of permanence is the herb garden. Some herbs are grown annually from seed, but a number remain for years in the same position. If a separate herb garden is arranged, it will probably be put quite near the house, so that it is easily accessible in all weathers. But more often, in the small garden, herbs are grown in a corner of the main vegetable garden. The selection of a sunny position for their cultivation is always more important than for the other kitchen crops, since

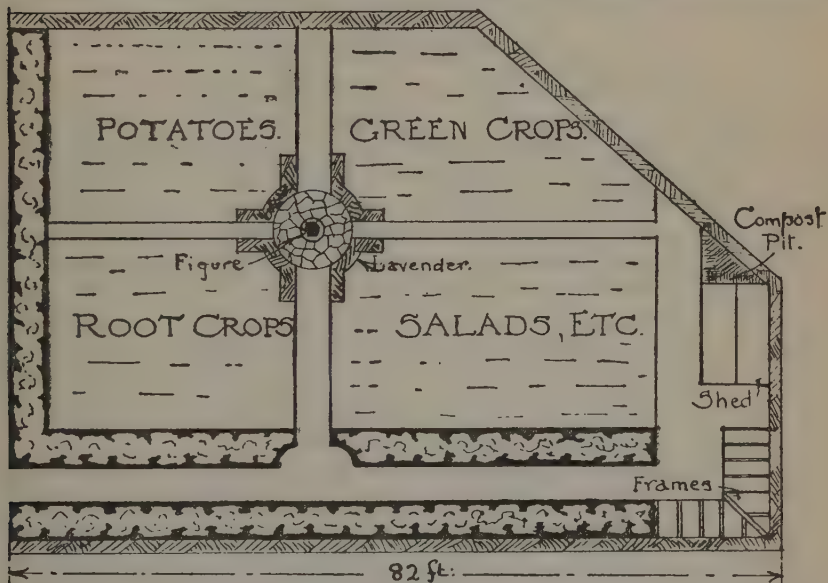
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only in a sunny open position do leaves become fully aromatic. (Mint is one of the few herbs that can be grown in the shade.)

Salads are next in importance to herbs, and the smallest garden should be able to produce emergency supplies of lettuce, radish, and mustard and cress in the hot weather.

Grow Unusual, Expensive Vegetables

The best way to approach the problem of allotting portions of the plot to various crops, is to decide first what are the most profitable things



A kitchen garden which is visible from the main lawn should have flower borders either side of its pathways. This is effective and also provides borders for flowers for the house

to grow. Peas and beans, fresh salads, and herbs, and the lesser known and more expensive vegetables such as Globe Artichoke I should place first. Root crops such as carrots, turnips, and parsnips are so cheaply bought that only in the larger garden is it worth while to grow them. Potatoes are definitely for the large garden where *all* the vegetables are home grown.

Having decided what kind of crops shall be included in the scheme, the next task is to place the permanent inhabitants. If the plot is odd-shaped, a good plan is to mark off a rectangular portion first, in the most convenient position, to be used for annual sowings, which are most conveniently managed in straight parallel lines. Then the remaining

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odd-shaped portions can be used for beds of mint, thyme, and other herbs, small salads; and possibly one section may be suitable for a nursery bed in which seedlings can be raised.

The paths dividing the various sections can be simple soil tracks in some cases, or cinder tracks, or paths of brick or gravel, but not of grass. Grass harbours slugs, soon gets churned up when a heavy wheelbarrow is being used in bad weather, and needs constant trimming.

A brick or tile-edged path is best, as this prevents the soil from the plot encroaching over the path, and keeps the top-dressing of gravel or cinder of the path off the cultivated soil of the plot.

Salads all the Year Round

The secret of the cultivation of good salads is quick and steady growth from the seed to maturity. These three things are essential—good rich soil, in fine workable condition, plenty of moisture, and warmth. Moisture and soil condition go together to a great extent. Deep digging and thorough breaking of the sub-soil, and the incorporation of manure or decayed leaves, make the soil porous, and able to lift moisture from a considerable depth by capillary attraction. Warmth can be taken for granted during the summer months, that is why salads grow so much more readily and are so much more tender when they are summer grown. Unless the gardener can provide himself with cold frames, and a fair quantity of stable manure, or with a heated greenhouse, fresh salads can only be grown during the warm months; if hot beds are available, they can be grown almost all the year round.

The main vegetable plot can be treated in exactly the same way as an ordinary allotment, and as a rule the size of the average allotment (that is, 10 rods) is ample vegetable garden to allow for a small family.

Digging and soil treatment are treated in Chapters XVI and XVII, but it may be remarked here that the best way to dig a large-sized patch of ground for vegetables is to bastard-trench. To make the work easier, the plot can be divided into two or four strips, lengthways. If two strips are dug in this way, one in one direction and the other back in the opposite direction, the soil from the first trench of each can be used in the last trench of the next strip. This relieves the work of the wheelbarrow in carting soil down the length of the plot.

Lime.—Special reference must be made here to the value of lime in the vegetable garden. To get good results, lime must be dressed all over the surface of the vegetable plot every year, using 2–8 oz. per square yard according to the soil. Apart from its value in releasing plant food in the soil, lime acts as an insecticide and a fungicide. It reduces “gall weevil” in turnips and “club root” in cabbages.

Seeds.—It pays to buy good seed; inferior seed germinates

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poorly. Moreover, inferior seed is probably seed from inferior strains of vegetables, which, however well cultivated, will not give the maximum harvest.

Soil Fumigants.—If a vegetable garden is being made on a patch of virgin soil, the use of soil fumigant during digging is specially advisable. If fumigant is not used it is almost certain that wireworms, leather jackets and other pests will be present in the soil, and these will ruin the finest crops.

Crop Rotation.—The vegetable garden is in part planned afresh each year, but if it is run in conjunction with the cultivation of bush fruits, a certain amount of it will be planned permanently. In any case, it is necessary each winter to do some re-planning of the plot in order to arrange for a rotation of crops. One of the first things to do is to decide what crops are to be grown.

The allotment gardener can get the best possible assistance in this matter from the leaflets issued by the Ministry of Agriculture, Whitehall Place, London. These not only deal with the common allotment crops, but tell the allotment holder how to arrange his plot in succeeding years. This point is of great importance. Farmers of old used to practise rotation of crops long before the scientific reasons for doing so were established.

Vegetables take from the soil varying proportions of the different foods. Green crops such as cabbages, for instance, take a maximum amount of nitrates, and leave the soil deficient in this food in consequence. On the other hand, the legumes, that is, peas and beans, actually leave the soil richer in nitrates than it was before, owing to the power of the root nodules of fixing nitrogen in the soil. It will be obvious to the gardener that less manure will be wanted if green crops follow the legumes, and use up the supply left as a legacy by the previous tenants.

Following up this line of reasoning, horticulturists have experimented and found that a vegetable garden can be reasonably managed by following the rotation given below. This has naturally to be adapted somewhat to the particular conditions of each plot, since some of the crops may not be grown at all, while others may be wanted in larger quantities. It may be remarked here that, owing to the reliability of prepared commercial fertilizers, suited to each crop, and mixed on scientific lines, there is really less need for the amateur gardener to worry about crop rotation to-day than ever before. If he wishes, for instance, to grow peas and beans only, year after year, there is no reason why he should not do so *on the same site*; nor why he should not grow cabbages and cauliflowers in a similar way. All he will have to do will be to spend a little more on fertilizers than if he followed a more scientific crop rotation, but this is a relatively unimportant point in the little garden.

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SUGGESTED ROTATION FOR A SMALL VEGETABLE GARDEN

Divide the site into three equal parts.

Section 1 will be planted the first year with peas and beans, the second year with parsnips, carrots, onions, shallots and allied vegetables, and the third year with green crops such as cabbage and cauliflower, brussels sprouts and savoy.

Section 2 will start with the roots, be followed by peas and beans and carry green crops the third year.

Section 3 will start with greens and be followed by roots, and then the legumes.

This rotation does not allow for inclusion of potatoes, which are, in fact, seldom grown in the small garden. Should a few be desired, however, they could take a part of the plot allowed for the cultivation of the legumes, which could be run in rows, here and there, between other crops in all three sections, their position shifting only slightly each season.

SUCCESSION OF CROPS

In addition to the above suggestions there is the possibility of following an inter-cropping routine during a single season. For instance, where celery trenches are dug out, lettuces or summer spinach are frequently planted out in rows on the ridges. The lettuces and spinach mature and are cut before the celery has to be earthed up.

Then again, a crop of early potatoes can be followed by broccoli, the April-sown plants of broccoli being ready to move from the seed or nursery bed by the time the earliest potatoes are lifted in June.

Or carrots, or beet, or lettuces can follow the early potatoes. French or intensive gardening is conducted on these lines, and the home gardener is strongly advised to take a leaf out of the French gardeners' book. The important thing to remember is that the soil must be in really good condition to produce crops in rapid succession. And it should also be kept in mind that to get the best from a plot, plants of different character should be chosen to follow each other. Cabbages should not, for instance, follow brussels sprouts, but they can well be planted out between two rows of early peas, which will not only be gathered before the cabbages come to maturity, but will help by giving a little shade to the young cabbages for a time after planting.

Though it needs perhaps a little more ingenuity on the part of the gardener to plan well a tiny, limited, vegetable plot, than when he can follow a recognized routine on a full-sized allotment, the results are well worth the extra trouble.

In the following pages, the commonest of kitchen garden crops are given alphabetically, together with special hints on their cultivation.

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ANGELICA (*Archangelica officinalis*).—A biennial, usually grown as an annual, from seed. It is sown in drills 1 ft. apart in April, seedlings being thinned to 1 ft. apart. It can also be sown in late summer, and the seedlings thinned in spring. It should not be allowed to flower.

The leaf stalks ~~are~~ sometimes blanched and eaten like celery, but are more frequently candied and used on cakes. (For the Herb Garden).

ARTICHOKES, CHINESE (*Stachys tubifera*).—Chinese artichokes are mostly grown in large gardens, and by those who grow vegetables for exhibition. They are not regarded as one of the ordinary crops of the home garden. However, amateur gardeners would do well to grow more of the less common vegetables.

The tubers of the Chinese artichokes are the part eaten, and these are curious in shape, being marked in a spiral fashion, somewhat like certain sea shells. They can be used raw in salads, for pickling, or cooked whole as a winter vegetable.

Light sandy soil is preferred, but any ordinary deeply-dug, well-drained soil in a sunny position will do. The soil should be thoroughly dug in autumn and forked over in spring, adding a dressing of salt and soot. Tubers are planted towards the end of March, using a small dibber. They can be set 3 in. deep in rows 18 in. apart, allowing 9 in. between each tuber.

Keep the hoe going during the summer and water them well if the weather is dry.

The tubers are lifted in October and stored in sand for use as required during the winter.

For exhibition it is best to leave them in the ground until they are wanted, to preserve the colour. Two varieties are in common cultivation—white and red.

ARTICHOKE, GLOBE (*Cynara scolymus*).—This is quite different from the Chinese and Jerusalem artichokes. The portion that is eaten is the flower head of scales or bracts.

The plant is a perennial and is so imposing and decorative in appearance that it is frequently grown in the flower border. Well formed flower heads, not over developed, are gathered for the vegetable dish.

Globe artichokes may be raised from seed sown in March in a temperature of 55° to 65°, or fresh stock can be raised from offshoots of older plants. Propagation by offshoots is preferable, as in this way the best varieties are obtained, seedlings being of mixed quality.

Deeply-dug, rich soil is essential for good cultivation. The rooted suckers or new plants are set out about the second week in April, in groups of three, 18 in. apart, with about 4½ ft. between each group. During dry weather the plants benefit from a mulch of stable manure and occasional waterings. Flower stems should not be allowed to grow during the first

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season, but during the second year the "chokes" will be of excellent quality.

Each autumn the old dead leaves are removed and the crowns covered with dried bracken and hazel sticks. A light dressing of decayed manure is also added, and forked in. Globe artichokes will continue to bear fine serviceable heads for five or six years after planting.

The best variety for the table is "Large Green Globe," which has rounded segments without prickles.

If Globe artichokes are cultivated for exhibition, the heads staged should be of even size, fresh, well coloured, and not too old, that is, close and firm.

ARTICHOKES JERUSALEM (*Helianthus tuberosus*).—A member of the sunflower family, and the only one in this country cultivated for human food. On account of its rapid growth, the Jerusalem artichoke is frequently used as a screen on the vegetable plot. It will grow in almost any soil or position, but it definitely repays good cultivation.

Planting is done in February or March. The tubers are set 6 in. deep in rows, with 2 ft. between each tuber. When the tops have blackened in autumn they are cut back nearly to ground level. The tubers can remain in the ground to be dug for use as required. The best varieties are New White, Old Red, or Purple Skinned.

It is worth noting here that the Jerusalem artichoke is second in food value only to the potato.

ASPARAGUS (*A. officinalis*).—Asparagus is a crop which ought to be grown by every owner of a vegetable garden where tenancy is fairly secure. It has the reputation of being a crop for large establishments only, and also for being a crop that is costly to grow. As a matter of fact, after the first two or three years of waiting, the asparagus bed yields a prolific crop for more than twenty years, and is in fact one of the most remunerative crops that can be grown.

It is worth remembering, when asparagus is cultivated, that it grows wild only in districts where the soil is more or less saturated with salt. Salt can be used as a dressing over the beds, and will improve the quality of the crop.

General Cultivation.—The preparation of an asparagus bed is extremely important; more so than in the case of most crops, because the asparagus will not be moved for a quarter of a century after planting. A sunny position should be chosen, and the ground should be thoroughly cleaned of all perennial weeds. Beds 4 ft. wide should be marked out and the soil in these beds thoroughly trenched to a depth of 2 or 3 ft. On light soil cow or pig manure should be mixed with the lower spit, while on heavy soil burnt earth and coarse grit with extra clean strawy manure is best, to improve the texture.

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The bed should be prepared in autumn and left rough on the surface so that the action of frost may reduce it to a fine tilth. Plant in April or May, setting a row of plants down the centre of each bed, 15 in. apart, and another row on each side of it, also 15 in. apart.

Holes should be made for the plants wide enough for the long thick roots to be spread out laterally, while the centre of each crown should be about 3 in. below the soil surface. Protect the roots while they are out of the ground if there are keen drying winds, or they will become dried out.

In no circumstances should asparagus be cut until the second year after planting, but from the second year onwards available shoots can be cut until the middle of June.

Berries should not be allowed to fall from the plants on to the bed, otherwise they germinate and form a mass of useless seedling plants.

Useful manures for the asparagus bed are common salt 6 lb., sulphate of potash 2 lb., nitrate of soda 2 lb., superphosphate of lime, 3 lb. These are mixed together and applied at the rate of 3 oz. per square yard at the end of March, and again when cutting is finished.

For Exhibition, the heads of asparagus are cut during the week previously, and stood upright in about 2 in. of water in a cool, light room, the water being changed every day. The heads selected for staging should have from 3-4 in. of green stem, and about 5 in. of blanched stem.

Asparagus can be forced by lifting suitable strong crowns and planting them in light rich loam in a hotbed, the temperature of which is about 60°. Forced roots are useless after the crop has been gathered, and must be thrown away.

A pest which commonly attacks asparagus is the asparagus beetle, which damages the tops. It is best controlled by using a derris wash.

AUBERGINE. Egg Plant (*Solanum melongena*).—This must usually be grown in Britain under glass in pots as our summers are seldom favourable enough for the fruits to ripen outdoors. Seeds should be sown in rich light compost at the beginning of February, potted up singly in small pots, and later moved into 6- or 7-in. pots.

The soil for the larger pots should be two parts loam, one part each of decayed manure and leaf-mould, and some sand. The tops of the growing shoots are pinched out when the seedlings are about 6 in. high.

The best table varieties are "Early Long Purple" and "Dwarf Purple." The white-flowered varieties, and some of the striped varieties are rather more decorative on the greenhouse shelf.

BALM (*Melissa officinalis*).—This can be grown from seed in April, or raised from spring or autumn cuttings. It is not often used now, though at one time it was frequently used for balm tea. (For the Herb Garden.)

BEANS BROAD (*Vicia faba*).—Broad beans are a popular vegetable

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for growing on the home plot. They are less popular as a market vegetable but largely because the growers allow the crop to become too old to be palatable. The best time to sow broad beans is in late autumn, that is, in October or November. Spring sowings should be in January or February, but no later sowings are recommended, since beans sown late in the season are particularly subject to attacks from black-fly.

The broad bean is a heavy feeder, and plentiful manure should be dug into the soil during the early winter.

The easiest way to sow is to take out a flat-bottomed trench with the spade, about 3 in. deep, and set the seeds along each edge so that there is about 6 in. between each bean. At least 4 ft. should be left between each double row.

When grown for ordinary use the beans do not need staking, but if they are grown for exhibition they should be staked, and grown as single stems, all side growths being removed, and the tops pinched out when the plants are about $2\frac{1}{2}$ ft. high.

Instead of sowing beans late in the season, in the open ground, they can be sown in the cold frame earlier, and transplanted 10 in. apart each way in a double row.

When the beans have set, an application of liquid manure given at frequent intervals will greatly improve the quality of the crop.

The best varieties to grow are the long-pod varieties such as "Exhibition Long-pod" and "Green-Seeded."

BEANS, DWARF OR FRENCH (*Phaseolus vulgaris*).—Dwarf beans should not be sown outdoors until the third week in April, and in very cold districts it is better to wait until the first week in May. A sheltered sunny site is desirable. After ordinary preparation the soil is dressed with soot, and lightly forked over again before the seeds are sown.

Drills are made with a hoe 3 in. deep, and 3 ft. apart, and the beans are set in a double row along the drill so that they are 5 or 6 in. apart each way; 2 in. of fine, good soil should cover them.

Slugs and snails are very fond of the young plants, and a dusting of copper sulphate crystals along each side of the drill is useful in keeping down these pests.

The hoe should be used frequently, and if the weather should turn very dry, water must be given. In addition to this a little complete fertilizer can be hoed in, or liquid manure can be used occasionally during the growing season. For Dwarf types, no support at all is required, but for the taller beans, any kind of support such as tall pea-sticks or wires strained to posts, or a length of chicken wire, must be provided.

For earlier crops a few seeds can be sown in boxes in April, in a temperature of about 55° . These are hardened off as soon as the first pair of leaves has formed, and as soon as possible they are planted out

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in their permanent position. In planting out, the seedlings should be buried right up to the first two leaves, and the soil should be made firm round them.

Frequent failures with dwarf beans are due to overcrowding. If all the seeds sown germinate, at least half of them should be pulled out as soon as the true leaves appear, leaving the plants spaced out about 12 in. apart.

BEANS, SCARLET RUNNER (*Phaseolus multiflorus*).—The scarlet runner is possibly more important in the amateur's garden than any other crop. It is grown for a double purpose, for it makes a decorative and very effective screen between one small garden and another, or between one part of the garden and another.

Well-grown plants may reach to 10 ft. in height, and if supported on strong wire or netting stretched between tall posts, or on a framework of beansticks sufficiently strong to stand up to summer gales, a few plants will produce an enormous crop.

Two things must be guarded against, they are frost and drought. Runner beans are heavy feeders. They like deep rich soil, well supplied with plant food and moisture. Given this, with an open situation fully exposed to the sun, they will bear prolifically for 2 or 3 months.

In southern gardens, seed can be sown in early May, but in cold northern districts they should not be sown until the end of the month. Seeds can be 3 in. deep in single rows 4 in. apart, with 6 ft. between the rows, or in double rows with 9 in. between each seed and the rows 8 ft. apart.

An easy way to ensure satisfactory soil conditions is to dig a trench 1 ft. deep. A 3 in. layer of well-decayed manure should be thrown into the bottom and covered with a 6 in. layer of soil. If the seeds are sown in this, they will be less likely to lack moisture and food than if sown in ordinary soil on level ground.

Bud Dropping.—Sudden changes of temperature, such as a sudden drop in the temperature at night, will sometimes cause runner beans to drop their flower buds before they mature. A check in the water supply will have the same effect.

For Exhibition.—Runner Bean pods should be selected for the show table when perfectly fresh and young. They should be of even size and appearance, and as a rule should be rich deep green in colour, long and straight. Some of the best varieties for cultivation in the amateur's garden are: Scarlet Exhibition, Best of All, Czar.

BEANS, WINTER.—Certain of the Dwarf French Beans are suitable for growing on to maturity instead of being gathered when they are green and the beans are stored dry for winter use. They are cultivated in exactly the same way as the ordinary dwarf beans, but the pods are

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allowed to ripen on the plants and are harvested just before the winter frosts.

The best variety for this purpose is the Brown Dutch Bean.

BEETROOT (*Beta vulgaris*).—Beetroot is a biennial raised from seed, and used during the first season of growth when the roots swell to a round or pointed shape.

As in the case of salads, the secret of growing beet is to grow it quickly to maturity, without any check. Beet seedlings cannot be transplanted satisfactorily, and the seeds are therefore sown where they are to mature. They can be sown in frames, but this is hardly worth while in the amateur's garden.

Beet grow best in a deep light loam, with plenty of drainage, although they will grow in almost any soil. Manure must not be used on the ground in which beet are to be grown. A soil that has been heavily manured for former crops, however, will prove ideal. The plants will be encouraged to make good-shaped roots, whereas in newly-manured soil they generally make a number of fangs.

Seeds may be sown outdoors in early May in drills 2 in. deep and 1½ ft. apart. These drills are drawn with a hoe, and the seed scattered thinly along them. When the seedlings are about 2 in. in height they can be thinned out, and later on planted out so that they are 1 ft. apart each way. Planting out should always be done in damp weather.

Beetroot must not be checked in any way, as this will often cause the plants to run to seed; constant hoeing helps to prevent this trouble. Only give water when absolutely necessary.

Two or three sowings should be made in succession so that fresh roots are obtainable for a long time. If early roots are wanted for exhibition purposes, they can be sown in frames in March. In the case of exhibition roots, weak doses of soluble fertilizer can be given occasionally, after the soil has been thoroughly soaked with rain or water.

Those roots that are not used during the summer for the table, should be lifted in September and stored for use during the winter.

They must be lifted very carefully and the tops twisted from them, not cut, leaving 2 or 3 in. of top growth on the crown.

The roots should then be stored in sand, dry soil, or ashes.

Grown for Exhibition.—When roots are grown for exhibition, particularly when the long-rooted kinds are grown, special holes should be bored for them. These are made with a crow-bar. A prepared compost consisting of old potting soil, with mortar rubble, wood ashes, and well-decayed leaves, rubbed through a ½ in. mesh sieve, is filled into the holes. Three or four seeds are sown on these prepared sites, and when the seeds show up, only the strongest one is allowed to remain. The holes should be about 1 ft. apart and 1½ ft. deep.

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Soot and lime, mixed with finely-sifted coal ashes that have been stored for some time, and strewn along the rows of beet seedlings, keep both slugs and birds away.

In choosing roots for exhibition, select those of medium size, clean, tapering, or perfectly globular, and free from blemish. The small root-lets must be trimmed off carefully, but a few of the youngest leaves are left on each crown. The root end of the beetroot should face the front of the staging. Lightly spray the roots with clear water at the last moment before the judging.

Some of the best varieties are: "Crimson Ball" and "July Globe" (round), or "Dell's Crimson" and "Covent Garden" (long).

BORAGE (*Borago officinalis*).—Grown from seed sown during April, in shallow drills 2 ft. apart. Plants are thinned to 15–18 in. apart. The flower petals are used to float on claret and fruit drinks. (For the Herb Garden.)

BEET, SPINACH. See SPINACH BEET.

BORECOLE (*Brassica oleracea acephala*).—A hardy winter vegetable that will succeed on any soil, light or heavy, but prefers rather heavy loam. Seed is best sown about the beginning of April in a nursery bed, the surface of which is raked to a fine tilth. Seeds are broadcast over this, and as soon as they are through the ground they are thinned out to allow the best plants to establish themselves as sturdy specimens. These are put out, as convenient, in the place where they are to grow on through the winter, allowing 2 ft. between the plants in the row, and about 3 ft. between the rows.

It is a good practice to allow the crop of borecole to follow the summer peas and beans. In this case they can be planted out between the rows while the pea crop still stands, so that they are protected from bright sunshine for the first few weeks.

As soon as the peas or beans have been cleared away, the ground between the winter crop should be forked over, and afterwards occasionally hoed.

"Clubbing" is sometimes troublesome, but a really good dressing of lime on the ground, before planting, will usually prevent its appearance. Any diseased plants that are noticed at planting time must be discarded, and burnt.

Good varieties for exhibition or home use are "Upcurled" and "Cottager's Kale."

For exhibition, the plants cut should be dark green, and heavily curled.

BROCCOLI (*Brassica oleracea botrytis asparagoides*).—This is an excellent vegetable for general garden cultivation, and provides good heads of flower at every season of the year, according to the time of sowing and the varieties selected.

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It is hardier than cauliflower, and therefore more suitable for general cultivation.

To obtain supplies for earlier winter use, seed is sown in March or early April under glass, or in a very warm border outdoors. It is hardened off as soon as possible, and transplanted when a few inches high to a nursery bed, the plants being set about 6 in. apart.

At the end of May or in early June the plants are set out in permanent quarters, 2 ft. apart in the rows and with $2\frac{1}{2}$ ft. between each row.

Those intended for use at the end of winter are sown from the middle of April to the beginning of May, in the prepared nursery bed. These are best transplanted in the same way as the seedlings raised under glass.

They can follow peas or beans, being planted between the rows, as advised for borecole.

A further sowing can be made at the end of May, which will produce good heads for use in late spring and summer. Except for occasional hoeing, no further cultivation is required, except that the crop may need protection during the winter in exposed gardens. A good layer of bracken, hay, or straw round the neck of each plant will serve.

Exhibition.—Heads intended for exhibition should be covered a week or two before the show with leaves taken from other plants, or the heads can have their own leaves tied round over them loosely.

Another way of protecting heads of broccoli which are not used until the arrival of cold weather, is to heel them over towards the north, covering the stem and roots with soil.

Useful varieties are as follows:

For early winter use.—“Veitch’s Self-Protecting,” “Snow’s Winter White.”

For late winter use.—“Evesham Giant.”

For summer use.—“Veitch’s Model” and “May Giant.”

BROCCOLI, SPROUTING—This is cultivated in exactly the same way as ordinary Broccoli, but instead of cutting the whole head, the sprouting side shoots are used as required. Its flavour is said to be improved by a touch of frost.

“Christmas Purple Sprouting” and “White Sprouting” are good varieties.

A perennial Broccoli which also belongs to the sprouting broccoli section is called “Nine Star” Broccoli. This produces small white heads, sometimes as many as twelve heads on a single plant, year after year in succession. This variety can be raised easily from seed.

BRUSSELS SPROUTS (*Brassica oleracea bullata gemmifera*).—A very easily cultivated vegetable, and suitable for every amateur’s garden. Plants are easily raised from seed sown in drills outdoors or broadcast on a nursery bed in April. They prefer to grow in a deep, rich, well-

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drained soil, but almost any garden soil can be brought into good enough condition for the crop by deep digging, manuring and liming. Lime is very important, as with all green crops.

Seeds can, if preferred, be raised under glass in March and pricked out into shallow boxes or the cold frame as soon as large enough.

Plants are ready for setting out in permanent positions when they are 6 in. high.

Deep digging and a good dressing of well-decayed manure are advisable before planting.

A succession of outdoor sowings can be made from April to the middle of June.

After planting, no special treatment is required, apart from keeping the hoe going between the rows, although an occasional dusting of fertilizer, well washed in by rain or clear water, will improve the crop.

It should not be necessary to provide any support for the stems, which, if they are well grown, will stand firmly enough on their own.

In gathering the buttons, they should be cut from the bottom of the stalk first. All large leaves on the plants that turn yellow should be carefully removed from time to time and put into the compost pit. The top head should not be cut until all the sprouts have been gathered.

On the show bench, the detached buttons should be shown with the rough outside leaves removed and the buttons piled in a pyramid on the dish. Unless specially stated in the schedule, it is not advisable to stage whole stems.

Useful varieties for home and exhibition are "Covent Garden," "Dwarf Gem" and "Darlington."

CABBAGES (*Brassica oleracea*).—All the cabbage family are descendants of the wild cabbage, common in certain coastal districts in this country. There are now two main groups of cabbages, those suitable for summer sowing for use the following spring, called in catalogues "Spring Cabbage," and those sown in spring to mature either in summer or autumn.

SPRING CABBAGES are sown in the third or fourth week of July, in a nursery bed of fairly rich soil, not recently manured. If the seeds are covered with finely-sifted wood ashes or lime rubble, insect pests will not be troublesome.

A second sowing can be made in August. The plants are set out in permanent positions as soon as possible, about a foot apart in the row, with the rows 18 in. apart. Some varieties may need rather more room. Beyond occasional hoeing, no further attention is required, although the plants respond to occasional doses of liquid fertilizer. For this, an ounce of nitrate of soda in a gallon of water, applied after the soil is wet, is as good as any.

AUTUMN CABBAGES are sown usually under glass in March with

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successional sowings at intervals up to the beginning of June. In general cultivation they may be treated exactly the same as for spring cabbages, distance apart between the rows being determined by the variety.

RED CABBAGE is grown in the same way as the spring and autumn cabbage, from seeds sown in August, transplanted 6 in. apart to a reserve bed in winter, and planted out in spring 18 in. apart each way.

SAVOY CABBAGES (*brassica oleracea bullata major*) are similarly sown in prepared beds. The Savoy is a winter green and, like Borecole, is supposed to be better for a touch of frost. Seeds are sown at the end of February or middle of March, and in succession to the middle of April. They are planted out permanently in June or July.

With all the cabbage group, transplanting should be done in showery weather if possible, and in the summer, transplanting should be done in the evenings. If the weather is dry and the plants have to be moved, the roots should be dipped before planting in a mixture of mud, water and manure. This is called puddling.

The winter and early spring varieties appreciate a little fertilizer of a general character, hoed in at the rate of about 4 oz. per square yard.

Good varieties for the small garden are:

SPRING CABBAGE: "Ellam's Early" and "Flower of Spring."

AUTUMN CABBAGE: "Primo" and "Winningstadt."

SAVOY CABBAGE: "Dwarf Green Curled," "Drum Head" and "Sugar Loaf."

PICKLING CABBAGE: "Blood Red."

CARDOONS (*Cynara cardunculus*).—An uncommon vegetable in this country, perennial, but easily raised from seed. Trenches are prepared in the same way as for celery, at the end of March. The seed is sown where it is to grow at the end of April, three or four seeds being sown, 18 in. apart, down the centre of the trench. They should be well watered after sowing, and a flower-pot should be inverted over each group of seeds. As soon as the seedlings appear, they should be reduced to one at each station, the pots should be taken away, and a few leafy branches laid over the trench until the beginning of June, when protection can be dispensed with altogether. The plants should be fully grown by September, if they are kept well watered all through the warm weather. The foliage should then be tied loosely together with raffia.

Blanching is done in the same manner as celery. A piece of paper about 6 in. in width is wound round the base. This is secured, and then soil is banked up against it.

A light stake is required by each plant. Earthing up in this manner is done about three times, and if frosty weather arrives some slight protection is given to the tops. The stems will be blanched in about a month's time but they need not be lifted until they are required for use.

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For exhibition they are lifted, washed, and wrapped in a damp cloth until it is time for the judging.

CARROTS (*Daucus carotus*).—The wild carrot is a native of England and of Southern Europe, and there should be no difficulty in growing carrots in most parts of Britain. For ordinary cultivation, carrots are sown outdoors in March, in drills drawn about an inch deep and 6 in. apart, across the vegetable garden. Carrot seed must only be sown on a warm dry day, not when the soil is sticky, and it is best to cover it with light sandy soil. The usual method, however, is to rake the surface lightly after sowing, so that the seed is just covered. Earlier sowings can be made in frames under glass.

Frequent hoeing during the summer, and regular thinning so that eventually the carrots are spaced from 6–12 in. apart is advisable. When hoeing has been done during the early part of the summer, it is advisable to tread along the sides of the row of plants. This presses the soil firmly round the necks of the plants and prevents green shoulders to the roots. It also helps to prevent attacks of the Carrot Fly.

Carrots should be lifted in September or early October, the leaves cut off $\frac{1}{2}$ in. from the roots, and the crop stored in dry sand or soil in a cool frost-proof shed.

Forcing.—Carrots can be easily forced on a hot bed, the soil of which should be old potting soil, with leaf-mould, light sandy loam, wood ashes, and sharp sand and a little complete fertilizer. This material is passed through a $\frac{1}{4}$ in. mesh sieve, and carrots sown on it, over a hotbed, grow rapidly.

For exhibition, carrots should be perfect in outline, deep in colour and quite free from any blemishes. If the soil is at all heavy, and in all cases for exhibition carrots, the system of boring holes should be adopted. Holes are made with a dibber or crow-bar in the soil in rows about a foot apart with 16 in. between the rows. Each of the holes is filled with specially prepared compost, which has been sifted through a $\frac{1}{4}$ in. mesh sieve. Two or three seeds are sown on each prepared site and when the seedlings show up they are reduced to one at each station. Very shapely roots can be grown in this way.

The chief trouble in growing carrots is from the Carrot Fly, which appears in May. It lays eggs which hatch out and cause disfigurement of the roots. A dusting of lime and soot along the rows during the warm days of May will keep the fly away and avoid trouble.

Good varieties for the amateur's garden are:

For frame culture.—"Early Nantes" and "French Horn"; for main crops, "Early Market," "Scarlet Gem" and "Prizewinner." On sandy soils where long roots can be grown easily, "Long Red Surrey" and "Altrincham" varieties are suitable.

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CAULIFLOWER (*Brassica oleracea botrytis cauliflora*).—This is a slightly tender vegetable which is grown in summer in the amateur's garden, to provide good heads in late summer and autumn. Alternatively seeds are sown in August and September and wintered in cold frames or under nand lights but this method is not so satisfactory as that of growing throughout in warm weather.

Spring-sown seed should be sown in frames under glass at the end of February or early March. These will produce plants for cutting from July to September. Outdoor sowings may be made from March onwards until the end of April. Seed can be sown broadcast in the nursery, and should be put into boxes or into a sheltered nursery as soon as they are large enough to handle. Seedlings should be hardened off ready for planting out in April, when they are set about 18 in. apart in the rows, leaving 2 ft. between the rows.

During the summer the hoe should be used frequently to keep down the weeds and to keep the surface soil open and friable. As soon as the young flower heads form, a dressing of nitrate of soda, using about an ounce to each square yard, should be well watered in. If preferred, an ounce of nitrate of soda can be dissolved in a gallon of water and applied as a liquid fertilizer after rain.

Wintering in Frames.—If seeds are sown later in the year, seedlings should be pricked out when quite small into cold frames to winter under glass. Ventilate freely all through the winter, and at all times protect the seedlings from frost. They should, if well treated, be short, sturdy plants for planting out in March and April. When they reach the open garden, slight protection should be given for a short time. A trowel should be used for planting out and, as far as possible, a ball of soil should be kept intact round each root. Fine coal ashes that have been stored for some time, strewn round the plants after they are put into the open, will keep slugs away. As with all the cabbage family, the ground used should be well cultivated, to a great depth, and thoroughly well dressed with lime.

For Exhibition Culture.—Cauliflowers are grown in the way already described but, a few weeks before the Show, the most promising plants should be selected and protected. For this the leaves can be tied loosely together at the top, and leaves from other plants also tied over them, to exclude the light. On the Show table the specimens should be medium sized, close and white, unmarked and perfectly fresh and clean.

Useful varieties for the amateur's garden are "Snowball" and "All the Year Round," for early sowing. "Autumn Giant" and "Improved Eclipse" for main sowings. "Early Bird" and "Autumn Giant" for autumn sowings.

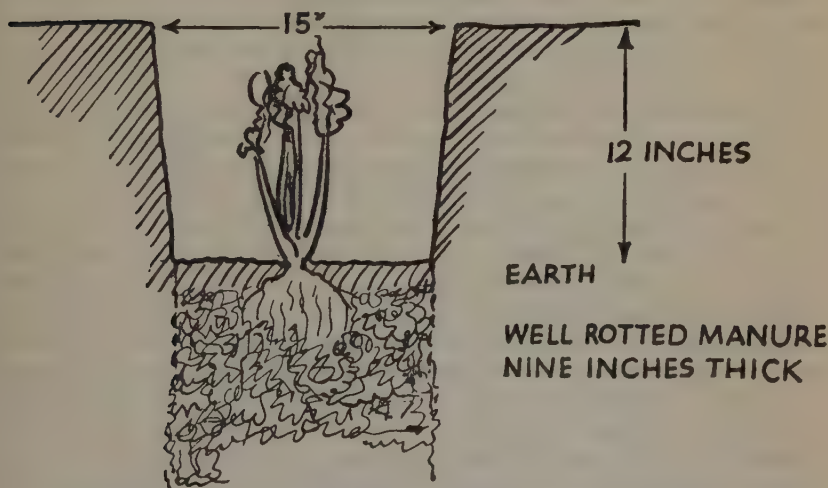
CELERY (*Apium graveolens*).—In its wild state, Celery is a marsh

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plant found in ditch bottoms and wild, swampy places. It is for that reason that it is usually grown in gardens in trenches where moisture can be given in liberal quantities. To grow Celery is a test of a gardener's skill, but the crop is so much appreciated when it is well grown that it is worth giving every attention to it.

Celery can be grown in any kind of soil if it is very deeply dug and well prepared. The preparation of trenches should be begun in winter. The trenches can be opened out about 15 in. wide, or if double rows are grown together, about 18 in. wide, with 3 or 4 ft. between the sides of rows.

CONSTRUCTION OF CELERY TRENCH.



Celery is easy to grow if the trench is well made in the first place. It is a marsh plant and loves plenty of moisture

The soil is taken out to a depth of 15 in. and the bottom well broken with a large fork. On this is thrown about 9 in. of very well-rotted manure. Those who live in seaside districts can use 9 in. of rotted seaweed, which is an excellent manure for this crop. Four inches of good prepared soil and a dusting of lime completes the preparation of the trench.

Meanwhile, about the middle of February, seed sowing is done under glass. Seeds can be sown either in pots or boxes in ordinary seed-sowing compost. They need only the finest covering of soil or sand. The pots should be kept reasonably moist.

As soon as the tiny leaves have formed, the seedlings are pricked out

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into boxes of richer soil, setting them about 3 in. apart each way and keeping them as near the glass of the frame as possible.

Ventilate on all possible occasions as the hardier the plants are grown the better they will succeed when they are planted out. If seedlings are well hardened off they can probably be planted out in May or June. Use a trowel for transplanting, and keep a ball of soil intact round the roots. Set the plants 12-14 in. apart, make the soil firm round them, and then soak the soil surface with water. At the same time as the celery is planted out in the trenches, small Lettuce plants can be set on the ridges. These will grow rapidly and be cut before it is time to earth up the celery.

Celery should not be allowed to get dry at any time, and after occasional watering, weak doses of liquid manure, specially that made from animal droppings and soot, will be beneficial. A dusting of soot over the foliage of the plants helps to ward off the celery fly which is one of the chief pests of this crop.

Earthing up.—Earthing up is a most important process in the cultivation of celery. It does not begin until the plants have grown practically their full size, but the time occupied in process is usually six or eight weeks. It is done in easy stages. The first stage is to draw the stalks together with soft string or raffia, and to surround them with a paper collar. The soil is then drawn up against the paper to a depth of a few inches. In about another week or so the collar can be pulled up a little higher, and more soil banked up against it. This is repeated until the soil and paper are right up to the crown of leaves. If celery remains until after the winter frosts have arrived, it may be necessary in very exposed districts to give a little protection to the plants. Clean straw or old bracken spread over the celery bed will be sufficient.

Varieties most suitable for cultivation are: "Dwarf Pink," "Dwarf White," "Aldenhams Pink," and "Giant Red."

When staged for exhibition, celery should be lifted the day before the Show, washed and trimmed of roots and outside leaves.

CHAMOMILE (*Anthem. nobilis*).—Can be raised from seed sown in April. It is grown as a perennial, the roots being lifted and divided like those of the ordinary herbaceous border. Flowers freely all summer, and is very decorative in the herb garden. The dried flowers are used for making chamomile tea, and also for shampoos. (For the Herb Garden.)

CHERVIL (*Anthriscus cerefolium*).—This is often called Sweet Cicely, and is suitable for large herb gardens or for the wild garden. Seeds can be sown at frequent intervals from March to October in shallow drills and the seedlings thinned to 6 in. apart. (For the Herb Garden.)

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CHICORY (*Cichorium intybus*).—This is a winter salad which might well be grown in far more gardens than at present. It is not difficult to cultivate, and for winter and early spring salads it is invaluable. It can also be used cooked.

Seeds are sown in April or May on well-cultivated ground not recently manured, in drills a foot apart. The seedlings are thinned out to 9 in. apart. No further cultivation is required beyond keeping down weeds by hoeing. In winter and early spring when the crop is intended for the salad bowl, plants are lifted with a fork and the foliage is cut off just above the crown. The roots are then packed closely together in boxes or in deep pots, and covered right to the top of the crown with good, fine soil. They are then stood in a shed or cellar in a position where no light can reach them. If the soil used is moist they will not need watering, but if it is dry, water should be given sufficient to keep them in a moist condition. Crisp, blanched leaves should be ready for cutting about three weeks after lifting.

The best varieties of chicory for the amateur's garden are "Witloof" and "Brussels Chicory."

CHIVES (*Allium schoenoprasum*).—A perennial herb with a flavour rather like a mild onion. The plants make excellent edgings to vegetable plots or to small beds, in the herb garden. When necessary they can be lifted and divided in spring or autumn. The part used is the leafy top, which is cut off close to the crown as required.

CLARY (*Salvia sclarea*).—This is a biennial sage, raised from seed sown during April in shallow drills, the seedlings being thinned to 1 ft. apart each way. At the end of the season the plants are cut off and hung to dry for use during the winter. (For the Herb Garden.)

CORN SALAD (*Valerianella olitoria*).—This is a salad crop not much grown, but it makes a useful substitute for Lettuce and Endive when these are unobtainable. Seed should be sown in September in well-manured, deeply-dug soil, raked to a fine tilth. Sow in drills 8 in. apart. Thin seedlings out as soon as possible to about 4 or 5 in. apart. Plenty of water is required, and the hoe should be used to keep the rows free from weeds. Leaves are usually available for the salad bowl all through the winter and early spring.

COUVE TRONCHUDA (*Brassica oleracea oblonga*).—This is commonly known as the Portugal Cabbage. It will grow in any ordinary well-prepared soil which has been deeply trenched and fairly heavily manured. An open sunny position is best.

Seeds are sown about the middle of March, broadcast thinly in the nursery bed. As soon as possible the plants can be set out in their permanent positions 2 or 3 ft. apart each way. The part eaten is the hard, leafy stems, and to ensure that these are well grown, tender and succulent,

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plenty of water and occasional soakings with liquid manure should be given.

A second sowing can be made in April if desired.

When the outer leaves have been gathered and used, the heart can be cut and cooked in the same way as an ordinary cabbage. The cropping season is winter.

CRESS, GARDEN (*Lepidium sativum*).—This is slightly tender, and unsuitable for winter cultivation outdoors, but during the remainder of the year it can be sown at intervals of ten days, sowing the seeds broadcast and pressing them down into the ground without any soil over them. Sheets of paper are laid flat over the seeds for the first three or four days, until germination takes place. The soil is kept moist, otherwise no attention is necessary. Both plain and curled varieties are grown and are very acceptable in the salad bowl. This is the Cress which is sold in association with Mustard. Like Mustard, it can also be grown in shallow boxes under glass, in a frame, or a heated greenhouse.

CRESS, LAND (*Barbarea præcox*).—This is a native plant that can be grown for use in the salad bowl. It likes a damp situation, preferably in the shade. Seeds can be sown in autumn, broadcast or in shallow drills. The growing points can be taken out for the salad bowl, and leaves that develop later can also be used.

CUCUMBERS (*Cucumis sativus*).—More cucumbers can be grown in the little garden of the average housing estate than are generally supposed to be possible. Even those who cannot make room for a cold frame or greenhouse can grow the Ridge Cucumber in the open garden with considerable success. It is of course essential to sow the seeds under glass.

Even this could be done by the enthusiastic amateur without the aid of a cold frame, since seeds can be raised in deep boxes, with a sheet of glass over the top to provide shelter from the late frosts.

A thick layer of horse droppings, over the drainage crocks, and 6 in. of good soil over this makes a satisfactory seed bed in such a case. The soil should only come to within 4 or 5 in. of the top of the box, so that the glass can be shut at night after the seedlings are growing well.

For open garden culture, Ridge Cucumbers are best. Sow the seeds singly in 3-in. pots in a cold frame. The seedlings are planted out at the end of the third week in May and if the weather is cold during the first week or two after planting, they are given slight protection.

Leaves and long litter, piled up into the form of a ridge, and covered with moderately good soil to a depth of 9–12 in. is a good permanent home for the plants. On this they are planted 3 ft. apart. During warm weather they are damped over frequently, and the shoots are pegged down as they grow. As soon as the plants are growing well remove the tip of the main stem.

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In warm summers, a plentiful supply of fruits will develop. Should the summer prove very wet and sunless, the use of a frame over the cucumber bed will make a crop more certain.

Useful varieties are "Bedfordshire Prize" and "Gherkin."

Cucumbers Under Glass.—Seeds of the large Cucumber are sown singly in 3-in. flower pots in a light sandy compost early in the New Year. Cover the seeds with $\frac{1}{2}$ in. of fine soil, water them with tepid water and plunge the pots in a hot bed. Temperature should be from 75–80°. As soon as the roots fill the small pots, the plants can be repotted into 5- or 6-in. pots, using equal parts of leaf-mould and fibrous loam with some sand. Put the plants in the soil right up to the first pair of leaves.

Cucumbers grow best in a span-roof greenhouse supplied with heating apparatus. A bed is made up for them of long stable manure and newly-fallen leaves, mixed together, over which is a covering of soil as in the case of Ridge Cucumbers. The soil consists of 3 parts of good loam and 1 part leaf-mould, with a little sand (amount according to the kind of loam) and broken charcoal.

Plants are syringed frequently during the summer weather, and walls and paths in the greenhouse are also syringed.

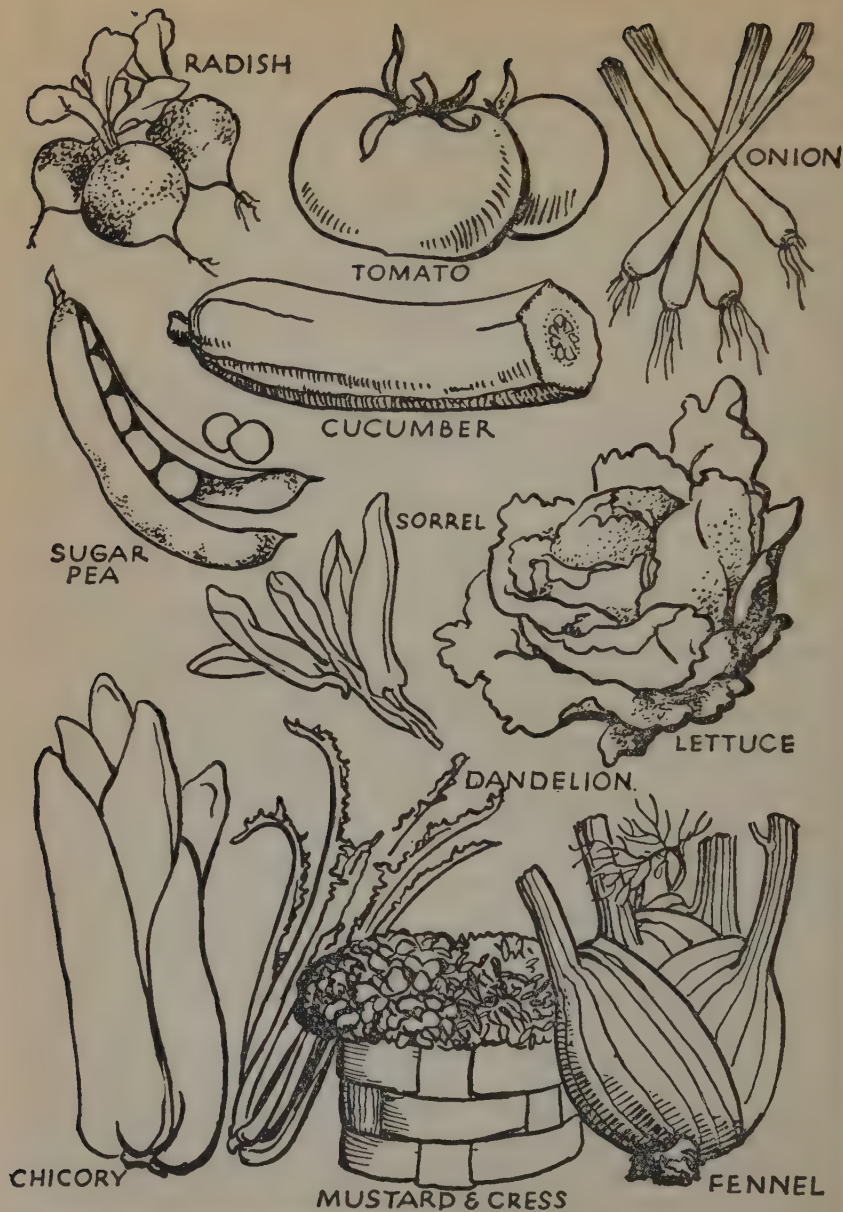
Watch for the appearance of pests; Black- and Green-Fly, etc., are sometimes troublesome, and if they appear, the house must be fumigated. Very little ventilation is required even in the summer.

Cucumbers can be grown equally well in pots or direct in the soil bed of frames, if the conditions described above are more or less reproduced; that is to say, the frames or pots should be kept warm, at an even and fairly high temperature, either by artificial heat, or by the making of a hotbed. All through the season of growth, ventilation is a very important point. There must be some, but too much ventilation can easily be given. If in a cold frame, cucumbers sometimes need the protection of mats thrown over the glass at night and removed in the morning.

In staging cucumbers for exhibition handle them as little as possible, so that the fruits look really fresh when on the Show table.

Good varieties for exhibition culture are "Telegraph," and "Rochford's Disease Resister."

DANDELION (*Taraxacum officinale*).—The common Dandelion makes a useful addition to the salad bowl. Cultivated Dandelions are far superior to those which can be gathered from the fields. Seeds can be sown in March or April in drills 15 in. apart and about 1 in. deep. Thin the seedlings to 1 ft. apart and keep the hoe going through the growing season. In spring the leaves should be blanched for use in salads by inverting pots over the plants. *Never allow them to flower* or the garden will be swamped with Dandelion weeds.



Besides the common salads, such as lettuce and tomato, there are many lesser known ones which the gardener could grow with a little extra care

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ENDIVE (*Cichorium endivia*).—This is a salad crop which ought to find its way into every amateur's garden. Several sowings can be made from about the beginning of April to July, so that a succession of plants is ready for the table. More sowings can be made in August and September on a warm border under a south wall.

Sowing should be in drills 1 ft. apart, and the seedlings thinned out to 1 ft. apart in the rows. A useful place for Endive is on the ridges between the celery trenches.

At the end of October the plants are lifted with a ball of soil intact round each root and replanted in frames fairly close together. As the plants are required for table use, they are blanched by loosely tying up the leaves so that the centre is kept away from the light. Alternatively, a flower pot can be inverted over each plant. They will be fit for the table in three or four weeks. In winter or spring the plants may be blanched in the greenhouse, or in a dark shed or cellar.

Useful varieties are: "Fraser's Broad Leaved," "White Curled," and for winter use, "Green Curled."

FENNEL (*Foeniculum vulgare*).—A very ornamental perennial plant, the leaves of which are sometimes used in sauces, while the stems can be blanched, cooked and eaten like celery. Seeds are sown in spring in shallow drills and thinned to 18 in. apart each way. Florentine Fennel is a variety which has broad thick bases to the leaves, and this part is cooked and eaten. (For the Herb or Wild Garden.)

GARLIC (*Allium sativum*).—This is not very popular in British gardens, but if desired it can be grown on any deeply-dug ground. The cloves are planted with a dibber, just covered with soil, and kept free from weeds during the summer. Plant in February, and lift the cloves when the tops die. Lay them out to dry, and finally store in a frost-proof shed.

GOURD. See PUMPKINS.

HERBS.—In a large garden the ideal way to make a herb garden would be to make a small garden of little beds designed on decorative lines with perhaps a sundial and seat. Such a garden could well be made near the kitchen quarters, particularly in any household where domestic help is employed. If so designed as to give privacy, and furnished as suggested with a seat, the herb garden would make an ideal summer resting-place for the staff.

Herb gardens are naturally suggestive of mediæval days, and it is for this reason that a sundial, or other old-fashioned ornament seems appropriate in the design. The herbs grown would, in such a case, be roughly divided into two classes. Some for instance, Marjoram, Lavender and Sage would be of permanent character and these would be used in key positions. Others, such as Parsley, Pot Marigolds, Angelica and Summer

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Savoury would be of ephemeral character, and sown each year afresh. The following herbs are suitable for inclusion in a small herb garden: Angelica, Balm, Borage, Chamomile, Chervil, Chives, Clary, Fennel, Horehound, Pot Marigold, Pot Marjoram, Mint, Parsley, Rosemary, Sage, Sorrell, Summer Savoury and Winter Savoury, Sweet Marjoram, Sweet Basil, Tarragon, Thyme. (For culture *see* under each name.)

HOREHOUND (*Marrubium vulgare*).—Raised from seed sown in drills 1 ft. apart in April, and thinned to 1 ft. apart, or from cuttings inserted in a shady part of the garden in summer. It is sometimes used for making cough medicine. (For the Herb Garden.)

HORSE-RADISH (*Cochlearia armoracia*).—The roots of horse-radish produced in the average amateur's garden are thin, woody and inferior in quality. There is no reason why reasonably thick, succulent roots should not be grown. They do not need a very rich soil; ordinary well-dug soil with a layer of manure in the bottom of each trench makes a satisfactory bed. Heavy soil should be lightened, and light soil made moisture-retaining by the usual methods.

Straight pieces of root, each with a crown, should be selected in February, and planted in the prepared ground about 1 ft. apart each way, the crowns being 5 or 6 in. below the soil surface. No attention is necessary beyond that of keeping the plot free from weeds. Good exhibition roots can be grown in this way.

KOHL RABI (*Brassica oleracea caulorapa*).—This is far more popular on the continent than in the British Isles. Where turnips are grown satisfactorily, they are usually preferred to this vegetable, but as Kohl Rabi will grow in many districts where turnip culture is almost impossible, it is a useful vegetable in many gardens.

Seeds can be sown broadcast in April and the seedlings transplanted as soon as possible into well-dug soil in rows 2 ft. apart allowing 18 in. between each seedling. Keep the plants well supplied with water and keep the hoe going frequently during the hot weather. This crop should be used before it gets full size, otherwise it loses its fine flavour and becomes tough and woody.

Varieties available are "Early Green," "Early White," and "Early Purple."

LEEKs (*Allium porrum*).—Leeks are useful because their season is winter, when they make a good substitute for onions. When grown for a good exhibition they are a test of the vegetable gardener's skill. A really fine exhibition leek should be 15 in. in length, perfectly blanched and with healthy green foliage at the top. To produce this an early beginning must be made by sowing seeds towards the end of January in light soil in well-drained boxes. Sow the seed thinly, keep the soil moist, and as

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soon as the seedlings show up, stand the boxes as near to the glass as possible. This will keep the seedlings sturdy and healthy.

Prick them off into other boxes containing a rather richer soil, that is, with two parts fibrous loam, and one part of leaf-mould and coarse manure, and a quantity of sand sufficient to make a porous compost. All this time the plants need a temperature of about 55° and as far as possible this should be kept uniform. Sudden changes of temperature are definitely harmful.

Leeks are generally grown in trenches prepared as for celery, that is, trenches 15 in. wide and about 15 in. deep, well broken at the bottom and with 9 in. of well-decayed stable manure and garden refuse, over which is 3 or 5 in. of good soil. The trenches should be about 3 ft. apart.

Planting out can be done in April or May, according to weather conditions. A trowel should be used and a large ball of soil kept intact round each root. Set them a foot apart, and water them well in. As soon as the leeks are established give them frequent soakings with water followed by liquid manure. Occasional watering overhead is also advisable.

Seeds can be sown later in the season outdoors, and the plants grown on in much the same way, but the crop will be later, and the plants not quite so fine.

For exhibition culture, the seeds are sown in January in heat, three or four seeds in a single pot. Seedlings are later reduced to one, and potted with as little disturbance as possible into 6-in. pots. Grow them as near the roof glass as possible. They are hardened off gradually, and by the second week in March should be ready for transfer to a cold frame. They are treated in the same way as leeks for ordinary use, except that extra liberal feeding is given; bonemeal is mixed with the soil of the trenches, and more liberal supplies of liquid manure are given.

Blanching.—In order to obtain long blanched stems, leeks are blanched in stages in the same way as celery, the difference being that in the case of leeks the blanching is done during the period of growth, and not after the plants are fully developed. One of the best ways is to use stiff paper collars about 6 in. wide, drawing these up a little as growth proceeds, and each time piling finely sifted sandy soil round the lower part of the plant.

Leeks for exhibition must be lifted very carefully to avoid any damage. The rootlets are left intact, but the tops are tied with raffia to keep the leaves from splitting. Wash them carefully and remove the outside leaves before the plants are staged.

One of the best varieties of leeks for ordinary cultivation is the "Lyon."

LETTUCE (*Lactuca sativa*).—Even the smallest garden should be able

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to produce a few lettuces in the hot weather on demand. It is a salad crop of particularly easy culture, requiring nothing more than ordinary well-dug soil, raked to a fine surface, and well supplied with decaying organic matter so that it retains moisture.

Seeds can be sown broadcast or in drills, the secret of outdoor culture being to thin out the seedlings early so that they do not crowd one another. In the larger kitchen garden or allotment an excellent place for growing outdoor lettuce is on the ridges between the celery trenches.

When lettuce seedlings are thinned from the outdoor sowings, they can be replanted in other parts of the garden, and will produce a later crop than the untransplanted seedlings.

Culture under glass is equally simple. Ordinary seed-boxes filled with a prepared compost can be used and the seedlings pricked out later into pots, deeper boxes, or the soil of the cold frame, according to season. The secret of good cultivation is to keep them steadily growing from the time the seeds are sown until the lettuce is cut. Any check, such as is given by lack of moisture or sudden change of temperature, will make the plants tough and less desirable on the table or on the Show bench.

When lettuces are staged for exhibition they should be large and compact, not ready to go to seed. The roots are washed clean, and will look well staged singly in clean flower pots.

Useful varieties for home cultivation are:

Cabbage varieties (those of round cabbage-like growth): "All the Year Round," "Continuity."

Cos varieties (tall lettuces, usually encouraged to "heart" by tying them loosely with raffia a week or two before they are ready for the table): "Mammoth White," "Cos Brown," and "Hardy Winter White."

MAIZE (*Zea mays*).—Maize or Indian Corn is not a crop for most gardens in this climate, but if it is desired, seeds should be sown in the middle of April in pots or boxes in a temperature of 60°. They should be potted singly into 3-in. pots and later planted out at the end of May after they are hardened off. The plants, if grown in rows, should be 3 ft. apart one way and 2 ft. the other way. The cobs are cut and used in a fresh green state before the seeds harden. As a rule this crop is more suitable for growing in flower gardens or shrubberies, where single plants make decorative specimens.

MARROW. See VEGETABLE MARROW.

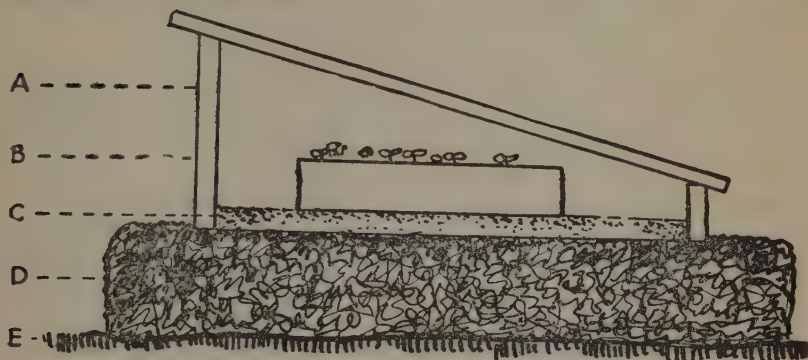
MINT (*Mentha viridis*).—One of the most easily cultivated of all herbs. It should be planted in some part of the garden where it can remain, and not gathered until the roots are well established. When once a good mint bed has been formed, it is unwise to disturb the roots too much. Some plants can, however, be lifted in autumn and packed into

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boxes in fairly light moist soil under glass, where they will provide useful winter supplies. [For the Herb Garden].

MUSHROOMS (*Agaricus campestris*).—*Anyone who can obtain fresh stable manure can grow mushrooms.* If this cannot be obtained it is useless to try to cultivate a mushroom crop. This does not mean that mushrooms never grow anywhere except on a bed of stable manure, but that failure would result in ninety-nine cases out of a hundred unless fresh manure were used.

Cultivation of mushrooms is fairly simple, the main steps to be taken



- A FRAME
- B SEED BOX
- C LAYER OF ASH
- D EQUAL QUANTITIES OF MANURE AND LEAVES
- E GROUND LEVEL.

A hotbed is a great help to the gardener. Details of construction are shown here

are these: Stable manure obtained in a fresh condition is thrown into heaps about 4 ft. high anywhere under cover. The manure should be thoroughly moist throughout, and should be kept in a moist condition. It should be turned at intervals of three or four days, during three weeks.

If shavings or sawdust are present, the manure should remain in these heaps longer and be constantly turned. At the end of this time the manure will have lost most of its objectionable odour, and will be quite pleasant to work. As soon as the temperature of the heaps decreases to about 120° the mushroom beds can be made up.

These can be made flat or ridged. The manure is built into the desired shape, and if the flat bed is chosen it should be 10 in. deep. When the temperature of the heaps falls to 70°, the beds can be

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spawned. Pieces of spawn about 2 in. square are inserted here and there over the bed, pushed in so that there is about 1 in. of the manure over the spawn. Press them in and cover them over firmly. Put a layer of soil over the bed from 1-2 in. deep. If the beds threaten to dry out, they should be moistened slightly with tepid water, but this will not be necessary in most cases. In a few weeks little buttons will be seen over the mushroom bed. These are gathered and a little more soil is thrown over. A bed usually produces mushrooms almost continually for several months. Mushroom spawn now supplied by specialists is extremely reliable, and with reasonable attention to the simple operations outlined above, any amateur should be able to grow good mushrooms.

MUSTARD (*Brassica (Sinapis) alba*).—Mustard can be sown in exactly the same way as advised for Cress, that is, sown on prepared ground outdoors without any covering of soil. It must be protected from birds by being covered with newspaper or mats for the first few days. In winter, it can be grown in the greenhouse in moderate heat.

ONIONS (*Allium cepa*).—To grow good onions is the ambition of every gardener. It has long been the common theory that onions will not grow in virgin soil, but only in soil that has been well cultivated for a number of years, and there is some reason for this belief. As far as possible an open, sunny position should be chosen and the soil should be deeply dug. Well-decayed farmyard manure should be worked in at the same time to a considerable depth.

Bastard trenching is considered sufficient by most growers, but some advise trenching the soil so that the lower layer is brought to the surface. The advisability of this depends largely on the condition of the soil. If it has been under cultivation for many years and the subsoil is in good condition, it may be brought to the surface, but if the surface soil is rather thin, and clay gravel, or chalk forms the subsoil, it would be very inadvisable to bring up the subsoil.

For ordinary household use, onions can be sown outdoors about the beginning of March. To prepare the bed for seed sowing it should be trodden and raked, and trodden and raked several times, so that though the lower soil is fairly settled, the top is light and friable. A dressing of wood ashes, soot and lime, dusted freely over the bed, together with sharp sand if the soil is inclined to be heavy, will assist in making the texture what it should be. All this material can be forked into the top 6 in. of soil before the treading and raking take place.

Seed will be sown in shallow, 1 in. drills about 12 in. apart. It is sown thinly along the drill, and covered by walking along the line pushing the soil over the seed with the foot and pressing it firmly. This ensures that the seed is in contact with the soil and is well covered. The final work of sowing consists in raking the seed bed in the same direction as the drills

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run. This somewhat loosens the surface soil, and gives a tidy appearance to the plot.

As soon as the onions show through the ground, looking like little tiny green wires bent over at the top, dust the bed with fresh soot, and give a similar dusting along the rows at frequent intervals all through the growing season. This serves a double purpose. It darkens the colour of the soil, and makes the bed relatively warmer, and it helps to keep away the Onion Fly, which is the worst pest of the onion in this country.

Any good fertilizer can be given on the onion bed. This crop responds very rapidly to the use of artificials. A good treatment is three parts of kainit, five parts of superphosphate of lime, mixed and applied in spring at the rate of four ounces per square yard, followed by small applications of nitrate of soda dusted, or watered along the rows at frequent intervals during the summer. Liquid fertilizer must of course, only be applied after the soil is already wet with rain or water.

When growth has nearly finished, bend the tops of the onions over to encourage the ripening of the bulbs, and about a fortnight later lift them and lay them on the ground to dry. They can then be taken up and stored in an airy frost-proof shed, either roped together or laid in trays or boxes where they can be turned over from time to time.

For exhibition Onions, a bed should be selected in the autumn and trenched if the soil is light, or trenched in spring if the soil is heavy. Soot, lime, etc., should be added as already described. About 15 in. should be allowed between each row and the plants thinned to allow about 15 in. between each. Overcrowding is extremely harmful. Seed is sown under glass in the middle of December, after Christmas, or the end of January.

For the seed boxes, soil from an old hotbed, with sharp grit, leaf-mould and fibrous loam is passed through a $\frac{1}{4}$ in. mesh sieve. It is filled in to about $\frac{1}{2}$ in. from the top of the box and made firm. The seeds are sown carefully about 1 in. apart all over the box. When the seedlings are about $1\frac{1}{2}$ in. high, they are pricked out into other boxes, in soil enriched by adding bone-meal. All this time the seedlings are kept near the glass in greenhouse in a temperature ranging from 55 to 60°. Keep the soil in the boxes open, by occasionally stirring it with the point of a stick, and as soon as possible harden off the plants, first by transfer to a cold frame, and then by removing the lights of the frame whenever the weather is suitable.

Transplanting the onions to the open ground is a delicate operation, which is of importance to the future of the plants. As large a ball of soil as possible should be retained with each root, and the plants should be set firmly about 15 in. apart. The usual time for planting out is about the

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middle of April. During the season, the hoe should be kept going and the foliage occasionally damped with a syringe and afterwards dusted with soot. Frequent application of a good fertilizer is advisable, and liquid manure made from animal droppings is also useful.

For exhibition purposes there is still no better onion than "Ailsa Craig."

It is best to ripen off the Show onions under glass after they have been raised from the ground, letting them lie in the open only in the middle of the day, and returning them under cover at night. The rough outside skins must be removed, and the one left to ripen should be smooth and clean. The necks of the onions should be tied down and made to look as small as possible.

Autumn-sown Onions.—The practice of sowing onions in the autumn for the following season's crop has much to commend it in gardens where the Onion Fly is particularly troublesome. Seeds can be sown in August and allowed to remain in the seed bed until spring, when they are lifted and planted out 15 in. apart each way. Such onions are usually free from attacks of the Onion Fly, which prefers the tender, newly-sown onions on which to lay its eggs. Another way to avoid the fly is to use onion sets, i.e. small bulbs, which are planted like shallots. The only trouble with these is that they show a greater tendency than seedlings to go to seed.

Pickling-Onions.—These are grown in exactly the same way as ordinary onions, but are sown towards the end of April in fairly poor soil.

Good onions for general purposes are as follows: "Ailsa Craig," "Bedford Champion," "Cranston's Excelsior" and "Silver Queen" (for pickling).

PARSLEY (*Carum petroselinum*).—Parsley is usually raised afresh from seed each year, as young plants provide the best-curved leaves. Any ordinary soil will suffice, and parsley can well be grown as a border edging round the vegetable garden or as edging in the herb garden. There is a common saying that "Parsley goes to the devil before it comes up." In other words the seed takes a long time to germinate. To keep a supply all through the winter months it is necessary to lift a few of the youngest plants at the end of the summer, and pack them into the soil of the cold frame.

PARSNIP (*Peucedanum sativum*).—This vegetable will succeed in almost any kind of soil, but if it is intended to grow parsnips on very rough stony land, it pays to adopt the practice of boring a hole as recommended for carrots. The ground should be well prepared in the ordinary way. Choose a plot which was well manured for the previous crop, and add no fresh manure, as this is harmful to roots.

Use fresh seed, as parsnip seed very quickly loses its vitality. Sow

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in February in drills an inch deep and 15 in. apart, allowing a foot between the seedlings after they are thinned.

For exhibition cultivation, holes are necessary. Make them 6 in. wide at the top, bored to a depth of 3 ft. Afterwards fill these with sandy compost containing plenty of leaf-mould. Frequent hoeing during the summer is all the further cultivation required.

Parsnips can be left in the ground to be dug as required during winter or, if preferred, they may be lifted and stored in the same way as carrots, so as to leave the ground empty for winter cultivation.

Good varieties are "Hollow Crown," "Magnum Bonum" and "Student."

PEAS (*Pisum sativum*).—Peas are possibly the most important of all garden vegetables to the amateur gardener. Even in gardens where no other vegetable is grown, a row or two of peas is often sown in some part of the ground out of sight of the ornamental garden.

The reason for its popularity as a garden crop is probably due to the fact that garden peas are so vastly superior in flavour to any of those sold in the market. Peas respond generously to good treatment. The land where they are to be grown should be thoroughly prepared early in the winter by deep digging and heavy manuring.

If this cannot be done early in the winter, the best thing to do is to take out trenches just before the seeds are to be sown, about 15 in. wide and 2 ft. deep. Throw the top foot of soil to one side and the bottom foot of soil to the other side as you work. Break up the bottom of the trench with a large fork, and then throw back the roughest of the material taken out. Over this put the remainder of the bottom foot of soil, mixing with it a liberal dressing of bonemeal, 4 oz. per yard run, and also add the remains of the bonfire, if available.

A good barrow load of stable manure to every 6 yards of trench is also advisable. The top soil should be thrown back until there is a shallow trench, about 3 in. deep, with a little soil piled up on each side. In this trench the pea seeds can be scattered 2 or 3 in. apart all over the bottom.

If birds or mice are likely to be troublesome, it is advisable to moisten the seeds with paraffin oil and dust a little red-lead powder over them before they are sown. A further 2 in. of fine soil should be added over the seeds and pressed down a little, so that each seed is in actual contact with moist soil. It is a useful practice to finish the seed-sowing operation by raking the surface tidy and pushing in small twiggy branches all along both sides of the trench. Taller pea sticks can be inserted at the same time if tall varieties are sown. The support provided should be as tall or taller than the stated height of the variety. If birds are likely

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to become troublesome amongst the growing seedlings, strands of black cotton stretched across the twigs will keep them away.

Sowings should be made from very early in the season until June in succession, so that a constant supply of peas is maintained. The earliest varieties such as "Little Marvel" and "Pilot" can be sown in early March. Second early varieties such as "Stratagem," "Admiral Beatty" and "Fillbasket" can follow these, and main crop varieties such as "Gladstone" and "Ne Plus Ultra" should be sown about May. For the very latest crops in June, early maturing varieties only should be chosen, as those which take a long time to mature would be likely to be damaged by the winter frosts.

Exhibition Culture.—When growing for exhibition it is advisable to prepare the ground as deeply as possible on the lines already indicated. It should be trenched in autumn or winter and plenty of farmyard manure dug in at that season. Lime is an essential dressing on soil intended for peas, and bonemeal, soot, wood ashes, well-decayed leaves, decayed cow manure and horse droppings are all useful.

Peas for exhibition are frequently raised under glass in small pots or in seed boxes. As soon as it is possible to harden them off, the seedlings are planted as carefully as possible in the prepared soil outdoors. They should be planted firmly and the soil surface between the seedlings should be covered with ashes to prevent an attack of slugs. Pea guards are usually advisable to protect the plants from birds. They cost only a few pence each.

In growing peas for exhibition, stakes are of great importance. Hazel stakes are good and, as already stated, they should be rather taller than the plants are expected to grow. Side growths should be cut away regularly from all exhibition plants and the points of the main stems should also be pinched out as soon as the fourth flower-spike is visible. The finest exhibition pods are produced from about the third spike of flowers. Peas should be thoroughly mulched with stable manure and the roots should be kept well supplied with water and liquid manure, occasionally using an artificial fertilizer instead of liquid animal manure. Before the pods begin to swell they should be examined, and any that appear to be defective should be cut off. On the Show table, each pod should be fresh and well filled, with the bloom still on the pod.

Useful varieties for exhibition are: "Early Wonder," "Stourbridge Marrow," "Premier," "King George" and "Autocrat."

POTATOES (Solanum tuberosum).—Potatoes are a crop which, though extremely valuable, are generally cultivated in allotments and large gardens and are usually excluded from the vegetable plot in the small home garden. The reason is that they occupy a good deal of space, time and attention, and the crop when it is grown hardly seems worth

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all that has been expended on it. The main crop potatoes are obtainable at such cheap rates in markets that the small gardener is discouraged from growing his own supplies.

In a garden of a fair size, however, it is usual to grow potatoes, and particularly the early varieties, partly because the quality of newly-dug potatoes is so superior to any that can be obtained from the markets.

Potatoes are not grown from seed but from what are usually called "seed potatoes" or sets. New varieties are raised from seed by specialists, but as in the case of many seeds, the seedlings vary so greatly in quality, that possibly only one in a thousand is any use at all. The amateur need not concern himself with questions of seed raising.

The supplies of seed potatoes offered are grouped into three divisions: early varieties, mid-season varieties, and late or main crop varieties.

The early potatoes are sown first, and mature earlier than the others because their season of growth is shorter. They do not crop so heavily, and partly because of this they do not need to be planted quite so widely in the rows.

Soils.—The best soil for potatoes is that of a rather light nature, but potatoes will grow on any kind of ground. A good crop can be expected from any well-cultivated plot. It is a favourite practice in breaking up new ground to plant a crop of potatoes the first season, partly because the potato is not averse to newly-broken soil, and partly because the cultivation of the potato is one of the most effective ways of cleaning the plot of weeds. The regular hoeing-up which is done for the potato crop, destroys the weeds during the summer months, and leaves the plot clean in autumn.

Sprouting the Tubers.—Potato tubers received as seed potatoes should be roughly about the size of an egg, and weigh about 2 oz. each. When they are received by the grower, they should be set to sprout in trays as soon as possible. Tests have been made with seed potatoes by setting some to sprout immediately they have been dug at the end of the season, and leaving them in the trays exposed to light and air (but of course kept away from frost) during the winter months. The result in such cases has been that fewer but sturdier sprouts have appeared on the tubers than when the potatoes are stored in the usual way, and set to sprout later in the winter. In any case, tubers should always be sprouted several weeks before they are planted.

The method is to pack them closely together on trays with the rose end uppermost. The "rose" end is the end where the eyes are gathered in a cluster. At the other end of the tuber there is usually a single mark where the tuber was at one time joined to the stem-root.

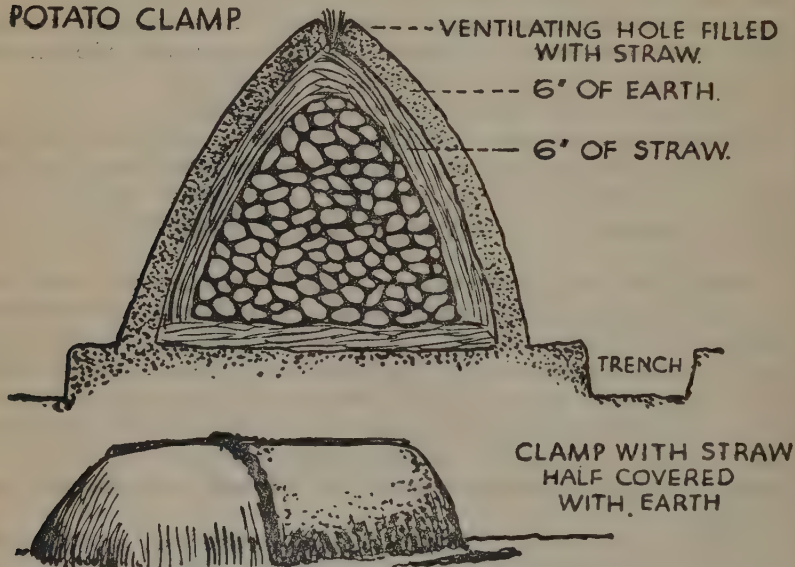
For ordinary outdoor culture the ground should be trenched and left rough until about the middle of March. By this time the seed tubers

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will have several stout shoots on them about 1 or 2 in. in length. Two shoots should be left on each tuber, unwanted shoots being rubbed off. The best way to plant is to open out trenches across the plot with a spade, throwing some old, well-decayed manure into the trench and setting each tuber on to this. Failing old, decayed manure, leaf-mould, or similar humus-containing soil can be used.

The tubers are set with 2 ft. 6 in. between the rows and about 15 in.

A POTATO CLAMP



Potatoes can be stored in a clamp until required for use. Details of construction are given here

between each potato, in the case of early varieties. Later crops are set with 3 ft. between each tuber, and the rows are spaced anything up to 4 or 5 ft. apart. The tubers are immediately covered with from 4-6 in. of soil and as soon as the tops show through (which will probably be sometime before the season of frost is over), the soil is drawn up with a draw hoe so that it is banked over the growing shoot. This protects it from late frosts.

In the case of very early crops some growers cover the early potatoes with twiggy branches or litter to protect them. It should not be necessary to earth up early potatoes again. In fact, no further attention need be given until the crop can be lifted. (This can usually be judged by the development of flowers on the tops of the potatoes.)

With late crops, some growers make a practice of earthing them up

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in two operations. The reason for earthing-up is chiefly that it keeps light away from the tubers. The tubers are actually underground stems and have a tendency in many cases to run along the surface of the soil rather than to bury themselves deeply below the top. The result is that sunlight reaches some of the tubers, and turns them green. Green potatoes are neither wholesome nor appetizing.

Spraying.—The most troublesome disease of potatoes to the amateur gardener is the ordinary *potato blight*. It is advisable, wherever potatoes are grown, to spray as a preventive against this. Bordeaux Mixture is used for the purpose, and one spray should be given about the middle of June, another in July and, in some cases, a third application in August. Spraying is only practised on the later varieties of potatoes, not on the first early crops. It is important that the spray should reach both upper and lower surfaces of the leaves, if there is the slightest indication that the potato blight is already present.

The Wart disease of potatoes is a notifiable disease, and immediately on its appearance the grower should communicate with the Ministry of Agriculture, Whitehall Place, London, S.W.1. In this disease the young shoots, when they are about 1 in. long, become coloured dark brown and often misshapen. The tuber later becomes withered in appearance, with unsightly looking crusts or scabs. Tubers are disfigured by black unwholesome looking scabs which gradually spread and affect the whole tuber. There is no known cure for this disease. If it does put in an appearance potatoes must not be grown on the plot for several seasons. If there has been any trouble from wart disease in the district, only potatoes which are guaranteed to be *immune* to the disease should be grown. Fortunately, many of the most popular varieties offered in catalogues now are immune.

Potato Scab, which is more unsightly than harmful, is sometimes troublesome to the amateur grower. The easiest way to treat it is to scatter flowers of sulphur in the trenches at planting time. Another cure recommended is to dip the seed potatoes in formalin solution before planting (1 pint formalin to 20 gall. of water).

Potato Leaf Curl is another fungus disease, but regular sprayings with Bordeaux Mixture will prevent its appearance.

The Colorado Beetle will not, it is hoped, prove a serious menace to British growers, but every gardener should keep his eyes open for its appearance. (For particulars see CHAPTER XVIII.)

Forcing Potatoes.—Where a hotbed is made up, potatoes can be forced, to provide a very early crop. They need, however, 15–20 in. between the rows, about 1 ft. between each tuber. They are planted carefully and given a good watering when the weather is warm, and earthed up a little as in the case of outdoor tubers. As the tubers are planted in autumn, from the middle of December onwards the potatoes

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produced will be considerably earlier than the main supplies grown outdoors. Careful attention must be given throughout growth to matters of ventilation and regulation of the heat of the hot-bed.

Potatoes for Exhibition.—In cultivating potatoes for exhibition the usual method as already outlined is adopted, but extra care should of course be taken in the preparation of the soil. Leaf-mould and old mushroom-bed manure thrown into the bottom of the trench and also used to cover the seed tubers after they have been planted, gives them a good start. Throughout the season dressings of soot are given from time to time. A useful fertilizer to use as required along the rows is made by mixing 5 lb. superphosphate, 2 lb. sulphate of ammonia and 3 lb. kainit, using this at the rate of 3 oz. of the mixture per yard of row.

When the potatoes are lifted, tubers of even size, not too coarse, with clean skins, and "eyes" as few and as shallow as possible, should be selected. They should be shapely and not deformed. Do not wash them until the last minute, and stage them as fresh as possible.

Varieties.—Constant cultivation appears to weaken any strain of potato. That is why new varieties are constantly coming on to the market and why the new varieties are for the most part more expensive than those which have been in commerce for a number of years. Some of the later introductions which are specially worth attention from the amateur who grows for exhibition are *Coloured Varieties* "Di Vernon," "Catriona" (kidneys) and *White Varieties* "Majestic" (kidney), "Great Scot" (round), "Arran Comrade" (round). (For storing in clamps, etc., see PAGE 418.)

POT MARIGOLD (*Calendula officinalis*).—This is the common showy garden marigold, the petals of which add a piquant flavouring to soups. It is extremely useful in the ornamental herb garden, and, well placed, can add a very desirable touch of colour. Seeds are sown in the ordinary way and thinned to about 1 ft. apart. If required in the kitchen, flowers can be picked and dried, and then stored for use as required. [For the Herb Garden.]

POT MARJORAM (*Origanum oleraceum*).—Usually grown from seeds sown under glass in March and planted out 1 ft. apart each way or sown direct in the open during April. It is cut down at the end of the season and hung in bunches in a dry shed for winter use.

PUMPKINS (*Cucurbita pepo*).—These are most frequently cultivated to-day for their decorative value, although they are appreciated as a vegetable by some.

Seeds are sown under glass in May in a temperature of 60°. Seedlings are potted singly and grown on to be ready for planting out the first week in June. Beyond planting in well-dug and manured soil, and keeping them well supplied with water, no further cultivation is required.

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The large-fruited Gourds (*C. maxima*) and Pumpkins (*C. pepo*) can be planted 6 ft. apart and the others 4 ft. apart. The smaller fruiting kinds are sometimes grown over pergolas. All varieties need some form of support, but they are very frequently grown to cover some unsightly corner or to smother trellis and poles.

RADISHES (*Raphanus sativus*).—Radishes are one of the most popular of salad crops. They can be grown outdoors all through the warm weather, and under glass in winter and spring. They are particularly suitable for cultivation on the hotbed, in about 6 in. of soil over the manure. Small sowings of radishes should be made every ten days throughout the season, to keep up a regular supply. In the open garden they are usually sown broadcast, but can be sown in rows between other crops.

The secret of cultivation is to keep them well supplied with moisture so that the growth is regular, and the plants do not receive any check. If they are set back by cold or lack of rain, the flower stems will develop instead of the roots becoming tender and succulent. Radishes grown during the hottest weather should be sown between taller crops so that they are sheltered from the sun, or in a position on a north or north-east border.

Winter Radishes, such as "Black Spanish," are sometimes grown, lifted, and stored in sand in a cool place in much the same way as are carrots. Radishes for use immediately they are harvested are "New Icicle," "Early Rose," "French Breakfast."

RHUBARB (*Rheum rhabonticum*).—This crop is usually grown in the vegetable garden and can occupy any odd corner. This does not mean that it does not require good soil, but that as the plants remain year after year without moving, they are best grown in some part of the plot away from the ordinary annual vegetable crops.

The best time to plant is in February or March, but the soil should be prepared the previous autumn, being trenched to about 1 yd. deep, and given a thorough dressing with farmyard manure, worked in from 1-2 ft. below the surface. Single crowns are planted 4 ft. apart each way. They are just covered with soil and then mulched with horse droppings. When active growth has begun the manure should be forked in.

No stems should be pulled until the second season after planting, but from then onwards the stems can be gathered early in the season each year. It is a mistake to gather rhubarb too late into the season, as it weakens the plants and makes them useless for subsequent years.

Rhubarb forces easily for early spring use. Two methods are available for the amateur gardener. One is to lift the crowns in December or January and pack them into boxes of moist soil, which can stand

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under the greenhouse shelves, or in any frost-proof shed. The soil is kept just moist, and the stems which grow, though they are thinner and earlier than the main crop stems, are more delicate in flavour and very often preferred to outdoor-grown rhubarb.

The other method is to invert over the plants wooden boxes, tubs or other coverings, and at the same time to pile over the crowns and round the edges of the boxes some old, decayed manure. It is best to remove the manure or fork it in as soon as the weather is warmer, otherwise the plants tend to become weak.

Rhubarb crowns that have been lifted for forcing are no further use another season, but plants that have remained in the open, and been forced a little by the inversion of boxes over them, will recover their hardiness and be satisfactory in succeeding years.

Propagation.—Rhubarb is increased as a rule by division of the crowns. Each separate crown should be pulled off and replanted in spring. Increase by seeds is also possible, though seedlings vary in quality and must be selected judiciously if good rhubarb crowns are to be obtained. The seeds are sown in drills in April, and the seedlings planted out in permanent beds the spring following. Good varieties of rhubarb are: "Dawe's Champion" and "Red Champagne."

ROSEMARY (Rosmarinus officinalis).—A fragrant shrub suitable for any part of the garden, but particularly for the herb garden. It will succeed in any soil but prefers a sunny, well-drained position. It can be raised from seeds sown in shallow drills and thinned out to about 6 in. apart, and planted out in spring or autumn into permanent quarters. It can also be raised from cuttings, either in autumn or summer, inserted in a shady border and kept moist. [For the Herb Garden.]

SAGE (Salvia officinalis).—This is raised from seeds, or may be increased by cuttings as described for rosemary. Cuttings are probably better than seeds, as plants of the best type will be certain. If required for winter use it can be cut and hung in bunches in a cool, dry shed.

In the ornamental herb garden it is advisable to let some, if not all, of the sage plants flower, as the flower spikes are very decorative. [For the Herb Garden.]

SALSIFY (Tragopogon porrifolium).—This is far more frequently used on the continent than in England, but it is worthy of more attention from the amateur gardener. It is grown exactly like parsnips or carrots and prefers rich, light soil. If it is sown on heavy ground, holes must be bored about 2 ft. deep with a crow-bar and filled with prepared, sifted soil.

Seeds are sown in April and thinned out to one plant every 12 or 15 in. The crop is ready for lifting in November, when it can be stored in sand or ashes as in the case of other root crops.

If required for exhibition, Salsify should be lifted carefully and washed

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very clean. The small rootlets should be cut off. The roots selected should be perfectly straight and uniform. If a few roots of Salsify are left in the ground in winter, they will produce "chards" in the spring, that is, young flower stems, cut and used in much the same way as Asparagus.

SAVOYS. See CABBAGE.

SCORZONERA (*Scorzonera hispanica*).—Scorzonera is another vegetable which is seldom grown and used in this country. It is cultivated exactly like Salsify except that the seed is not usually sown until early May. The roots are ready for lifting in September or October. They can, however, be covered with light litter and left in the ground until required for use.

For exhibition, the method of boring holes in the ground as advised for Carrots, Parsnips, Salsify, etc., should be adopted.

SEAKALE (*Crambe maritima*).—This vegetable is grown, forced, and blanched before use on the table. It can be raised either from seed or by rooted cuttings, but the root cuttings are best, as seedlings are of less certain quality. When the crop is lifted in autumn for forcing, pieces of the root are made into cuttings and each will produce a crown fit for forcing the following year.

The plants are best obtained in March and set out at a distance of 15 in. apart each way. They are put in with a dibber. If several shoots develop from one root, all are removed except the strongest. After that, the only attention during the summer is to hoe frequently and to give light applications of artificial manure or frequent drenchings of water followed by liquid manure. At the end of October or after the first hard frost, the foliage is taken off the crop, lifted, trimmed, and stored away in ashes or sand. The fleshy roots are cut off close to the main stem, then cut into 6-in. lengths, tied in small bundles, put into boxes 6 in. deep, covered with soil and stored cool. A very little heat and moisture given in the early part of the year, that is, about February, will start these cuttings into growth so that they will be fit for planting in spring.

Permanent Beds.—Plants prepared from cuttings made in the previous autumn are planted in permanent beds which have been deeply trenched, allowing 4 ft. between the rows and $2\frac{1}{2}$ ft. between each plant in the rows. Plant firmly and keep the hoe going between the plants. About the middle of November forcing begins. If the plants are forced in the open, the ground is cleared of all leaves and rubbish, ashes are piled over the crowns and a Seakale pot inverted over each group of crowns. Leaves piled up firmly over the pots will create a temperature of 50–55°.

Another method which can be practised later in the season is to pile up the soil over the crowns in ridges. As soon as the ridge of soil cracks at the top, it is a sign that the shoots have developed, and the crop is ready for cutting. After the crowns have been cut the soil should be

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cleaned up, and manure forked in, so that the plants will recover. The best varieties are "Purple-tipped" and "Lily White."

Plants lifted in November and replanted in moist soil in the greenhouse, in a temperature of 50–60°, provide a crop in the early part of the year. Roots that have been so forced are valueless.

SHALLOTS (*Allium ascalonicum*).—Many gardeners prefer to grow shallots rather than onions, partly because the work put into soil preparation is not quite so arduous. Any ordinary garden soil that has been winter dug will suffice. The bulbs should be pressed about half-way into the soil in February. They are perfectly hardy and frost will not harm them. They should be 10 in. apart in the rows, and the rows about 1 ft. apart. Keep the hoe going during the season and lift the bulbs at the end of June when they have completed their season's growth.

• If shallots are wanted for exhibition, they should be grown in an open, warm part of the plot and the ground should be heavily manured. Medium-sized bulbs should be chosen, and planted a little wider apart than for ordinary use. Weak liquid manure made from animal droppings should be given frequently during the growing season. Before harvesting, bend the tops over as advised for onions and lift them carefully and dry them under cover. They should be cleaned and staged in dishes of about twenty-five "cloves."

SORREL (*Rumex scutatus*).—This is raised from seed sown in shallow drills 1 ft. apart, seedlings being thinned to 6 in. apart. Keep the ground hoed regularly and in September move the plants to permanent quarters, setting them 18 in. apart each way. About every three or four years the roots should be lifted and divided, and replanted in a fresh situation. Flowers should not be allowed to develop. The leaves of Sorrel are used either cooked or raw in salads. [For the Herb Garden.]

SPINACH (*Spinacia oleracea*, vars. *glabra* and *spinosa*).—Every amateur should grow Spinach in the garden, if only because freshly-cut Spinach is in a very much better condition than any that can be bought.

It can be sown at regular intervals in the same way as Lettuces in order to keep up a supply. For this the round-seeded Spinach is best. It is sown in drills drawn 1 in. deep in any convenient position, such as between peas and beans. Spinach will mature quickly and will be gathered before the peas and beans reach maturity.

Spinach will grow in suitable positions outdoors even in winter, but for regular supplies in cold districts it is best to sow the winter crops in the frame. No special cultivation is required beyond good preparation of the soil and regular hoeing to keep down weeds.

SPINACH BEET (*Beta Sicla*).—This is a variety of Beet grown for its leaves only; that is to say, for the fleshy mid-rib of the leaves, which is cooked and eaten like asparagus.

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Seeds are sown thinly in drills 18 in. apart, and about 1½ in. deep, at the end of March. The soil should be rich and open.

Thin out the seedlings to about 15 in. apart, and keep the plants well supplied with water and liquid manure, made from animal droppings, throughout the summer. Quick, unchecked growth is essential to make large succulent leaves. When required for use, the outer leaves are cooled off, not cut.

For exhibition purposes, Spinach Beet is sometimes grown in pots. Seeds are sown in the pots in a cold frame, and thinned out so that about three plants are left to a 6-in. pot.

SPINACH, NEW ZEALAND (*Tetragonia expansa*). This is often grown as a substitute for the common Spinach. It can be sown under glass in boxes and pricked off in the same way as Cabbages and later transferred to the open garden about the end of May. Or it can be sown direct in the open, in shallow drills 2 ft. apart, at the end of April. Seedlings should be about 1 ft. apart in the rows and at least 2 ft. must be allowed between each row. No special cultivation is required for this. The parts eaten are the leaves and the young shoots.

SPINACH, PERPETUAL (*Beta cicla*).—This is actually a variety of Beet-root, but in this case the leaves are used for the table. Seeds are sown in March and the seedlings thinned to about 6 in. apart. The plant is a perennial, and the leaves are cut as required at any season.

SUMMER SAVORY (*Satureia hortensis*).—This is easily raised from seed sown in spring in shallow drills and thinned to 1 ft. apart each way. Winter Savory (*Satureia mintana*) is a perennial plant. It is treated as a rule in the same way as Summer Savory and raised fresh each season. [For the Herb Garden.]

SWEDE. *See* TURNIP.

SWEET BASIL (*Ocimum basilicum*).—This is raised from seed sown early in April under glass, pricked out 2 in. apart each way, and finally planted out at the end of May 9 in. apart. At the end of summer the plants are pulled up by the roots, and tied in bunches for use when required for flavouring. [For the Herb Garden.]

SWEET MARJORAM (*Origanum marjorana*).—Treated as a half-hardy annual, sown under glass in February, and transplanted 9 in. apart each way, or sown in April in the open garden. Leaves can be used, or the stems can be cut and hung in bunches for winter use. [For the Herb Garden.]

TARRAGON (*Artemisia dracunculus*).—A plant of the same family as Southern wood or Old Man. It is a perennial which should be divided in early spring each year, portions being replanted 1 ft. apart each way. It can also be increased by cuttings. Stems can be cut and tied in bunches for winter use. [For the Herb Garden.]

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THYME (*Thymus vulgaris* and *Thymus serpyllum citriodora*).—The common thyme and the lemon thyme are both useful herbs in the kitchen. Both can be raised from seed, but the easiest way to increase the stock is by division of the roots during March or April.

Both appreciate light soil and are excellent plants for cultivation in the rock garden if a special herb garden is not made.

They are very fragrant, and can usually be gathered fresh for use at any season of the year, though it is also advisable to dry some stems to be sure of having enough leaves for winter use.

TOMATOES (*Lycopersicum esculentum*).—There is no more popular crop for the little garden than the tomato. To be certain of success, tomatoes must be grown under glass, but in favourable seasons and in sheltered gardens reasonably good crops of fruits can be obtained from outdoor plants, and should the fruits not ripen in the open they can either be used green for pickling or brought indoors and ripened in a warm room.

Cultivation of the tomato is comparatively simple, yet there is no crop which presents more difficulty to the novice. In the first place it is impossible to grow tomatoes season after season in any garden or greenhouse without sterilizing the soil used. The tomato disease is almost certain to put in an appearance sooner or later with fatal results.

The soil for cultivation of tomatoes under glass can be easily sterilized by the use of Cheshunt Compound, or formalin, as a soil drench before the seeds are sown. A pint of commercial formalin to thirty gallons of water may be used for the purpose.

Tomatoes are sown at any time after the New Year in open sandy soil in well-drained pots. They need a temperature of 50° for the germination of the seeds, and can obviously be sown thus early in the season only where heat is available. Before the second leaves are made they are potted up singly in small thumb pots, each seedling being buried up to the seed leaf.

For these pots a mixture of leafy soil and sand with a little light loam is used. Water the soil with tepid water after potting. As the pots are filled with roots, the plants are potted on into 3-in. and later into 6-in. pots, a little heavier compost being used each time the plants are shifted. The ideal soil for the final pots (or for the border, if they are grown in one) is made of three parts fibrous loam, one part old manure from an old hot bed, or leafy soil finely sifted, sufficient sharp sand to make the whole porous, and as much as is available of wood ashes from the bonfire. Bone-meal can also be mixed with the potting soil if desired.

The general cultivation of the plants consists in training the main stem of each to some sort of support, usually under glass to a bamboo cane, and in the regular pinching out of the side shoots that develop in the axils of the leaves. Care must be taken, of course, not to pinch out the flower trusses in mistake.

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Pinching is practised to restrict the growth to a single main stem, so that more food goes to the trusses of fruit, and also so that more sunshine will reach the fruits.

As the plants develop they are fed with occasional doses of a weak liquid manure which is, however, best given after the first fruits have set. The atmosphere in the house should be fairly moist except while the flowers are open, during which time a rather dryer atmosphere is required. It is a good plan, about noon during the time when the flowers are wide open, to tap each cane lightly. This shakes the pollen dust on to the pistil, and encourages the setting of fruits.

Stimulant for General Use.—A useful stimulant on pot tomato plants which can be safely used during the growing and fruiting season, where ordinary animal manure is not easily obtainable, is 1 oz. of phosphate of potash and 1 oz. of nitrate of potash to 1 gall. of water. This should be applied only after the soil has already been soaked with clear water.

Amateur growers would do well to keep in mind the fact that tomatoes are fruits and therefore need plenty of phosphatic manure (bone-meal is an example). They can be fed with nitrates in the form of sulphate of ammonia, or nitrate of soda, but these fertilizers are best given only after the fruits have set, otherwise they tend to encourage leaf production rather than fruit production.

If diseases and pests appear amongst the tomatoes, fumigation of the greenhouse with any of the recognized commercial fumigants and spraying with Bordeaux mixture are measures that can be resorted to with safety. Badly diseased plants it is always safest to destroy, to prevent the spread of infection.

For exhibition, tomatoes should be staged with the stalks on the fruits, choosing well-coloured and solid, even-sized specimens in preference to an irregular assortment.

Outdoor Culture.—In any fairly-sheltered garden, tomatoes can be grown in a row along a south wall or fence. Or they can be grown in a row across the vegetable plot, where ample sunshine will reach them.

Plants are generally obtained by the amateur in pots from the nursery about the first week in June. If there is any choice, the plants obtained should be short jointed, sturdy, and dark green in colour. Any that are long, drawn, and pale, have been too long in heat, and will be tender, and liable to a set-back by sudden exposure in the open garden. Moreover, plants that have been drawn in this way never completely recover and will not produce the quantity of fruit that can be expected from sturdier plants.

Tomatoes are grown outdoors on the single-stem system, just as described for greenhouse culture. That is, the side shoots are regularly pinched out, so that only one main stem is left.

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When they show about four bunches of fruit it is advisable to pinch out the top of each main stem, as it is unlikely that more than this number of fruit trusses will be able to reach maturity and colour well. Pinching out the top causes all the nourishment of the plant to go into the fruits that are already set.

Amateurs frequently make the mistake of stripping all the lower leaves off tomato plants. As far as possible the foliage of all plants should be kept intact during the growing season, for the sound reason that the *leaves are the food factories of the plant*, and if they are removed the general health of a plant is bound to suffer. In the case of tomatoes it is important to allow sunshine to reach the fruits, and where the plants have been well fed, and have consequently developed luxurious foliage, it may be advisable to cut back the leaves, say half-way, or sufficiently to allow more sunshine to reach the fruits. But to strip the plants is weakening.

In September, if there is likelihood of frost, any fruits that have not yet coloured and been gathered, should be cut from the plant and hung in bunches in a warm room, where they will quickly ripen. The plants themselves should then be *pulled up and burnt*. This is an important point, as plants left lying on the surface of the soil, or dug into the soil, are very likely to spread tomato disease, so that tomato culture would be impossible another season.

Useful varieties of tomatoes are as follows:

Indoor: "Best of All," "Perfection."

Outdoor: "Sunrise," "Open Air."

TURNIPS (*Brassica campestris*).—The turnip is a native of this country and should be satisfactory in all gardens. The chief difficulty is experienced in gardens where soil is naturally dry. It is very important that turnips should grow rapidly without a check from seed to harvest.

Seeds can be sown in deeply-dry soil not recently manured, as soon as the first warm days come in February or March. Soot and wood ashes dusted over the soil before sowing are a help. Sow in drills 15 in. apart, and thin the seedlings as soon as possible to 6 in. apart.

Seeds should only be lightly covered, and raking the soil in the same direction as the drill is usually sufficient. Turnips are not hardy enough to stand the severest frosts, and any that are not used before the end of the summer should be lifted and stored as advised for carrots.

Culture under Glass.—Turnips force easily from seeds sown early in the New Year in frames over a hot bed. The plants should be thinned to 6 in. apart each way and given as much air as possible on all fine days. Occasional syringing will assist rapid growth and the roots will consequently be more tender.

The chief trouble with turnip cultivation is from the Turnip Fly

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Short grass clippings from the lawn, strewn over the surface of the soil round the plants during the hot summer days, does a good deal to keep the fly away. Soot and lime dusted along the rows is also effective.

For the Show table, turnips should be washed and the small roots should be trimmed off, but the end of the tap root should be left whole if it is not too ungainly. Select roots that are of uniform size, with clean, tender skins.

Useful varieties are: "Snowball" and "Golden Ball."

Swede, Garden (*Brassica rutabaga*).—The Garden Swede is cultivated in the same way as a turnip, but is rather hardier. It is preferred by some people on account of its stronger flavour.

VEGETABLE MARROWS (*Cucurbita pepo ovifera*).—Vegetable marrows are easily-grown plants which are frequently used to cover an unsightly corner of the vegetable garden. They are raised usually under glass from sowings in April, and planted out towards the end of May.

The best way is to plant them out over a bed made up of stable manure and covered with 6 or 9 in. of good soil. If they are wanted to grow over rough rubbish heaps, etc., each plant should be planted in a large pocket of soil over a foundation of manure.

An excellent plan for giving the marrows an early start is to plant them out in the middle of May, and to invert a large flower-pot or similar protective cover over them each night, removing it in the morning.

Seeds can be sown singly in 3-in. pots in February for the earliest supplies of the plants, which are grown under glass. But marrows are such a cheap vegetable in the markets, that few amateurs care to occupy their frames and greenhouses with them except in the early seedling stage.

If a good variety of marrow is grown one season, it is perfectly satisfactory to save some seeds from one of the later marrows, which has been left to ripen on the plant, and to sow them the following season.

Extra Large Fruits.—Numerous devices are adopted by exhibitors all over the country for increasing the size of marrows, and while the practice still obtains of offering prizes for the largest marrow at local shows, there will still be keen competition in this matter.

One common device is to arrange strands of thick wool leading from a jam jar of water to the marrow stalk, the wool being threaded through the stalk, which is first pierced. The effect of this is to allow the fruit maximum supplies of water, so that it swells to a large size. It is an interesting experiment to treat two apparently identical fruits in the garden, one in this manner, and one left to grow normally, so that the difference between the two can be seen.

Apart from these special classes for large marrows, it is a mistake to stage heavy marrows on the exhibition table. Small marrows, which

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are young and tender so that the skin could easily be pierced by a slight pressure of the nail, are the best for the kitchen, and will command most points from judges at shows.

If the fruits are ready before the show day, they can be kept fresh by cutting them, and standing the stalks in a little water.

Innumerable good varieties are obtainable both in green and white colourings.

WATERCRESS (*Nasturtium officinale*).—Few amateurs realize that watercress can be quite well grown in the ordinary garden without any stream. It certainly likes moist soil, and for this reason is grown in trenches. Beds are made up so that the surface soil is about 3 in. below the ordinary level of the plot, and cuttings of watercress are dibbled in about 6 in. apart each way.

Unless the season is wet, or unless the soil is naturally very moist, water must be given in liberal quantities. This is the reason for opening out the shallow trench, since it encourages rains to run towards the roots. If watercress is grown in a small running stream, it will be finer in quality than that grown in the ordinary garden. It is essential in such a case to keep the stream clean by annual attention.

Storage of Vegetables.—In most cases, vegetables are used as soon as possible after gathering, except in the case of root crops for winter consumption.

These are frequently lifted at the end of the summer, and stored in boxes of dry sand, soil, or ashes. The essential thing is to keep them away from frost, but not too hot, and if they can at the same time be kept from drying out too rapidly, their condition will be all the better.

In large gardens, allotments, and where storage space is limited, root crops can be stored in the open in a "clamp." This is made as follows:

The highest available part of the plot is chosen, and the roots—potatoes, parsnips, turnips, or others—are piled there in the form of a long ridge. To keep them from actual contact with the soil, a layer of straw is laid down first. Straw can also be used between each layer of roots.

After the pile is made, straw is used to cover the sides of the ridge, so that frost is excluded. Over this straw is piled more soil, dug from the base of the ridge, leaving a shallow trench. The soil covering should be about 4–6 in. thick. The trench round the clamp serves to catch heavy rains, and keeps the clamp drier.

A few handfuls of straw are allowed to protrude here and there from the top of the ridge, like small chimneys, and indeed they serve that purpose, for they carry from the clamp moisture and heat that might cause trouble, and they allow for good ventilation among the roots in store.

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Roots so stored will remain in good condition for many months. They can be used from one end of the ridge, the straw covering being always put back so that frost cannot enter.

PESTS AND DISEASES IN THE VEGETABLE GARDEN

The amateur is possibly troubled more by pests and diseases in the vegetable section than in any other part of the garden. Specific remedies for all the commonest pests are given in Chapter XVII. Every gardener would, however, do well to keep in mind that clean cultivation, deep digging, adequate manuring, and regular doses of lime will do more than anything else to keep the vegetable garden free from both diseases and pests.

A plant that is attacked by disease can often "grow away from it," if it is in congenial soil and well treated. Constant vigilance is the secret of success, however, and unless the amateur is quite certain, when he sees a disease or pest on any of his plants, that he can deal with it quickly, the best plan he can adopt is to *pull up the plant immediately and burn it*. If occasional diseased specimens are treated in this way, disease will probably be very quickly stamped out.

The chief things to be done to fight pests and diseases are:

- (1) Use plenty of lime in all parts of the vegetable garden.
- (2) Use soil fumigant whenever soil is being trenched in winter.
- (3) Keep a stock of a good fungicide and a good insecticide handy.

In a little garden it is often preferable to keep one of the commercial preparations in store. A good home-made fungicide is permanganate of potash crystals, which are used in water at just sufficient strength to make it a pale rose colour. This is a safe soil drench, or spray, for use almost anywhere in the garden or greenhouse.

Several good recipes for insecticides are given in Chapter XVIII.

THE YEAR IN THE VEGETABLE GARDEN

January

Finish all digging as soon as possible.

Protect chicory, celery and endive from frosts.

Begin mushroom culture now. Fresh stable-manure is essential for this crop.

Early potatoes should be set to sprout now. Some can be planted in the cold frame, and in a very warm, sheltered border a few can be planted outdoors.

Sow early-maturing varieties of peas in a sheltered position. As soon as the young plants show, sprinkle lime and soot among them to keep

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away slugs. Put in twigs at sowing time. They break the wind, and give a shelter to the young plants.

Protect globe artichokes with litter, leaves or soil.

A few broccoli leaves should be bent over the flower-heads for protection.

Plant out cabbages on a sheltered border, if seedlings are available, and mild days occur.

Force asparagus crowns and seekale.

Make up hotbeds.

February

Plant early potatoes.

Seeds sown this month must be protected during the late winter frosts.

Where seeds are sown in the open, cloches or rows of twigs will give protection.

Sow cabbage, early cauliflower, leeks and Brussels sprouts under glass, and broad beans and peas in the open.

Plant shallots now. Press the bulbs half-way into the soil 8 in. apart. A dressing of an ounce of kainit to four square yards can be given to the soil before planting.

Sow tomatoes not later than the end of this month.

Prepare the soil of tomato beds by deep digging and allow it to settle a little before the plants are put in.

Cauliflowers and lettuces in frames should not be coddled.

Onions sown in boxes should be thinned if necessary.

Hotbeds made up last month need daily attention to keep up the heat.

Globe artichokes, vegetable marrows and tomatoes can be sown on them.

Prepare composts for seed-sowing.

March

Sow broad beans, broccoli, cauliflower, cabbage and Brussels sprouts in lines or boxes for transplanting later.

Sow carrots, leeks, parsnips, kohlrabi, spinach, swede, garden turnips, marrowfat peas and early potatoes in the open.

Sow mustard and cress, lettuce, radishes and onions for salads, and the tender vegetables—broccoli, cauliflower, celery, cucumber, and also tomatoes and alpine strawberries—on a hotbed.

Prepare new beds for globe artichokes.

Watercress can be sown now in moist trenches.

Potatoes can be planted now.

Divide and replant chives.

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April

Watch the potato patch for the Colorado Beetle.

Kale, Brussels sprouts, cabbage, savoys and perpetual spinach are sown now for the winter months.

Protect seeds from birds by stretching black cotton over them.

Globe artichokes can be planted immediately on arrival. Large stocks can be raised from suckers later.

Plant in well-prepared gritty soil with a top dressing of sifted coal ashes after planting to keep away slugs.

Rapid growth is the secret of tender succulent salad crops. Successional sowing at intervals of two or three weeks should be made of lettuce, radishes, mustard and cress, and silver-skinned onions.

Make a herb garden. Herbs need full sunshine to develop a good flavour. Those grown from seed should be sown this month; these include: borage, sorrel, pot marjoram, pot marigolds, thyme, angelica, sage, chervil, summer savory.

Dress asparagus beds with salt.

Prepare ground for Brussels sprouts, cauliflowers, lettuces and runner beans.

Dig celery trenches now.

Frost is still a danger. Mats, straw, newspapers, twigs from evergreens, and dry litter are useful protections.

Thin out carrots, onions, parsnips, etc., as necessary, and use the hoe as soon as possible between the rows.

Use black cotton or pea-guards to protect seedlings from birds.

May

Keep a look out still for the Colorado Beetle on potatoes.

Make a further sowing of broad beans if specially desired.

Seedling cabbages raised in boxes in a cold frame are ready for planting out. Heavily-manured ground is best. Hoe frequently during the hot weather.

Asparagus seedlings need to be thinned. Leave the plants 1 ft. apart. Keep the permanent beds free from weeds.

Globe beet sown in the frames should be thinned out to 8 in. apart.

Sow the outdoor main crop of beet. Thin seedlings and hoe between the rows, drawing the soil up against the seedlings to protect them.

Those in specially prepared holes should be reduced to three plants at each station, and finally to one, which should be as near the centre as possible.

Plant out the broccoli seedlings in well-prepared soil; make a further sowing in the frame.

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Make a further plantation of Brussels sprouts.

Sow cardoons in trenches prepared as for celery. They need plenty of water.

Earth up potatoes as necessary.

Carrots sown in January and February should be thinned, and the thinnings used in soups and salads. Those sown in the open should be thinned to 8 in. apart.

Sow cauliflowers in a frame, and keep the bed well watered. Give a dusting of soot occasionally.

Plant out seedlings as they are ready. All established plants on the plot should be fed liberally with liquid manure and mulched with long stable litter.

Transplant celery.

Sow lettuce for succession. Thin out the seedlings and use them for planting between tall crops.

Sow peas during this month for use in late summer.

Make frequent sowings of turnips, and cover them with grass clippings to discourage the turnip fly.

Sow seeds of ornamental gourds and pumpkins outdoors.

June

Sow *first early* peas, i.e., varieties which mature rapidly. They will be harvested when the earlier sown peas are over.

Cut no more asparagus after the middle of this month.

Plant out celery. Celery is a marsh plant and needs manure in the soil to retain water.

Radishes and lettuces can be planted between the celery trenches.

Plant out tomatoes against a south wall or fence.

Plant out ridge-cucumbers on a sunny bank.

Plant vegetable marrows; they are useful smother plants for untidy corners.

Plant Brussels sprouts, broccoli, cauliflowers, kale and savoy between rows of early peas, or in their place when the crop has been gathered.

Plant celeriac; this is an excellent crop on soils where cultivation of celery is difficult.

Dress seakale with salt and shallots with nitrate of soda.

Vegetable marrows planted last month should be "stopped."

Sow turnips in shallow drills 1 ft. apart. A shady bed is desirable.

Sow seeds of endive now, on a firm bed of good rich soil.

Break a leaf over each cauliflower head to shade it.

Potatoes may still be earthed up.

Stake runner beans.

Onions should be fed with nitrate of soda.

THE VEGETABLE GARDEN

July

Hoe regularly between all crops.

Sow spring cabbage, carrots and beet in drills 15 in. apart.

Plant out Brussels sprouts, broccoli, kale and sprouting broccoli in showery weather.

Use liquid manure on rhubarb and seakale.

Plant leeks.

Shallots can be harvested this month.

Lift early potatoes as the tops turn yellow.

Spray late potatoes with *Bordeaux Mixture*. Do this twice during the month.

Sow parsley for winter use.

Sow early-maturing varieties of peas in light rich soil.

After the crops have been gathered, all cabbage stalks, bean stalks and pea haulms should be burnt.

Cut heads of globe artichokes when less than three parts open.

Cut mint, sage, thyme and marjoram for drying.

Pinch out the tops of outdoor tomatoes.

Give plenty of tepid water to marrows.

Dust soot and lime along the celery rows to keep off both the celery fly and slugs. Celery and leeks should be earthed up gradually.

Mulch vegetable marrows with cow manure, short litter, grass clippings or leaves.

Bend a leaf over the heads of cauliflowers that are nearly ready for use.

Spray French and runner beans with tepid water in dry weather.

August

Earth up celery and leeks.

Plant out seedlings of broccoli, savoy and endive, or sow seeds of cabbage, stump-rooted carrots, lettuce, onions, spinach and turnips to follow the early crops.

Herbs can be dried and stored for winter use.

Water peas in dry weather and mulch them with manure.

Pinch out side-shoots from outdoor tomatoes; thin the lower leaves; remove any that are turning yellow.

Spray potatoes with *Bordeaux Mixture*.

Green manure light soil by sowing mustard seed thinly over the soil, after early crops have been lifted. When you are ready to dig the plot in winter it will be turned into the ground. It is a good substitute for stable manure on light soil but should be supplemented with artificials.

Keep the hoe going whenever the weather is dry.

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September

Potatoes should be lifted when the haulms decay. Store carefully in clamps or in boxes in a shed.

Hoe frequently.

As crops are gathered burn rubbish, or dig it immediately into the soil to decay.

Bend over the necks of onions.

Dust Brussels sprouts with soot.

Dress nitrate of soda between broccoli plants and stir the soil with a hoe.

Plant spring cabbages on land previously occupied by onions.

Protect the heads of cauliflowers by breaking a leaf over each.

Sow lettuce to plant out in spring. Tie up heads fit for blanching, and plant out seedlings.

Cut down the tops of old mint. Give a light dressing of manure.

Sow radishes, spinach, turnips, mustard and cress.

Keep leeks well watered.

Lift beet and carrots and store them in sand.

Earth up celery.

October

Lift rhubarb crowns and force them under the greenhouse stages.

Earth up celery and leeks.

Corn salad and early peas, radishes and spinach, may still be sown.

Lift and store horse radish.

When the fruits on outdoor tomatoes are ripe take the plants up and burn them.

Lift and store all roots except parsnips and Jerusalem artichokes.

Beet should have the leaves twisted—not cut—off.

Store carrots in sand, potatoes in clamps or in sacks under cover.

Some litter over the parsnip bed makes it possible to lift roots even if the ground becomes frosted.

Top-dress asparagus with 6 in. of well-rotted manure.

Plant out cabbage seedlings. Draw a little soil up round the stems to protect them.

Gather unripe tomatoes and bring them indoors.

Lift a few roots of mint, and grow under glass for winter.

Lift endive and plant it in a cold frame. Blanch as required, by placing a mat over the glass or by inverting a pot over each plant.

Lettuces should be treated in the same way as endive, except that they should not be blanched.

Prick out parsley seedlings in rows 6 in. apart, in the cold frame if a winter supply is wanted.

THE VEGETABLE GARDEN

November

Finish earthing up celery and leeks.

Collect all fallen leaves. These are useful for hotbeds.

Dig all the ground possible during dry weather; leave the surface rough.

Cut down the stems of globe artichokes. Remove decaying leaves and protect the crowns from frosts with stable litter. Take off suckers from the old crowns and plant them in pots.

Cut down asparagus and give mulch of short stable manure over the bed.

In soil that is light and warm (or in pots under glass) a few broad beans may be sown. Sow in drills 3-4 in. deep, allowing 2 or 3 ft. between the rows.

Early peas can be sown this month in warm soil. "Peter Pan" is a good variety for the purpose. Do not sow in the open in cold soils until early spring.

Heel over broccoli to the north, and cover the stems with soil.

Lift cauliflowers and heel them into cold frames, or in some place well protected from frosts. The leaves should be tied loosely together over the crowns.

Lift chicory roots and plant them in boxes of soil in the greenhouse or shed. Keep them dark, and they will provide young white shoots for salads.

Whenever possible air the cold frame where lettuce is grown.

Blanch endive in successive batches.

Seed potatoes should be examined and any diseased tubers burnt. If left, the disease spreads.

Horse radish may be planted this month if the weather is suitable.

Plan next year's vegetable plot. This is very important, specially if intensive culture is practised.

Dig, trench and dress the plot with soil fumigant as desirable.

Cover rhubarb and seakale with light litter.

December

Blanch endive and seakale by covering with pots and adding light litter.

Cabbage, broad bean seedlings, etc., may be lifted out of the ground by frost. Press the soil back round the seedlings.

Trench celery beds when the early crop is finished.

Set a few potato tubers in shallow boxes this month, and plant them in the cold frame in the New Year.

Clean up herb gardens.

Examine potatoes, carrots, beet and onions in store, and burn any that have begun to decay.

Sharpen peasticks, sort over all stores, oil tools, clean and paint tool-sheds, and prepare for the New Year in the vegetable garden.

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SOWING TABLE OF COMMON VEGETABLE CROPS

<i>Name of Vegetable</i>	<i>When to sow or plant</i>	<i>Depth to sow</i>	<i>Distance between the rows</i>	<i>Distance apart in rows</i>
ARTICHOKES .	Mar. . .	5 in.	2½-3 ft.	10-12 in.
ASPARAGUS .	April . . .	1 in.	18 in.	15 in.
BEANS, BROAD .	Nov., Feb., April . . .	3-4 in.	2 ft.	4-6 in.
„ FRENCH .	May and June .	2-3 in.	18-24 in.	8-10 in.
„ RUNNER .	May and June .	3-4 in.	5 ft.	9 in.
BEET . . .	April, May and June . . .	2 in.	15 in.	4-5 in.
BORECOLE OR KALE	April or May .	½ in.	2 ft.	18-24 in.
BROCCOLI . .	Feb., April or May . . .	½ in.	2½ ft.	2 ft.
BRUSSELS SPROUTS	April . . .	½ ft.	3 ft.	2 ft.
CABBAGE . .	Feb., April and May . . .	½ in.	1½ ft.	1½ ft.
CARROT . .	Spring and August . . .	½ in.	1 ft.	4-6 in.
CAULIFLOWER .	Feb., April and August . . .	½ in.	2 ft.	18 in.
CELERY . .	Feb., June or July . . .	⅛ in.	4 ft.	1 ft.
CELERIAC . .	June . . .	⅛ in.	1½ ft.	1 ft.
CUCUMBER, RIDGE.	Feb. or March, under glass	—	—	—
ENDIVE . .	June . . .	¼ in.	1 ft.	1 ft.
LEEKs . .	March . . .	¼ in.	1-2 ft.	1 ft.
LETTUCE . .	Sow at fort- nightly intervals . .	¼ in.	1 ft.	6-9 in.
ONION . .	Mar. or April .	¼ in.	15 in.	1 ft.
PARSNIPS . .	Mar. or April .	½ in.	15 in.	1 ft.
PEAS . .	Mar. and April.	3 in.	3-5 ft.	4-6 in.
POTATOES . .	Feb., April . .	4-6 in.	1½-3½ ft.	12-24 in.
RADISH . .	Feb., Oct. . .	¼ in.	6 in.	3 in.
SHALLOTS . .	Mar. . .	1 in.	9-12 in.	6 in.
SPINACH . .	Feb. to Sept. .	¼ in.	15 in.	3 in.
TOMATO . .	Jan., May, under glass	¼ in.	—	18 in.
TURNIP . .	Jan., May . .	½ in.	15 in.	9 in.
VEG. MARROWS .	Mar. (in heat).	1 in.	—	—

CHAPTER XIII

ARCHITECTURAL FEATURES—PERGOLAS—SHELTERS—GREEN- HOUSES—FRAMES—POPULAR GREENHOUSE PLANTS.

ARCHITECTURAL FEATURES

IT is very difficult to say what constitutes architecture in a garden. To say that it implies brick, wood or stone structures only, which is what we intend when speaking of architecture generally, would be too restrictive; we must therefore interpret it in its widest sense, and take it to include all those adjuncts to a modern garden which, if sensibly used, can make the garden so much more enjoyable, convert it into an outdoor room, and, by contrast, accentuate the beauty of the flowers and plants.

We must not, however, neglect those features, such as summer houses and bridges, which definitely are architectural. If one has a stream or a pool at hand the question of choosing the most suitable bridge is of prior importance; it would obviously be a mistake to put a Japanese bridge in a garden otherwise obviously English in character, while it might add considerably to the charm of one devoted to flowering cherries and weeping willows.

Similarly, a stone seat might harmonize with one garden yet ruin another, and we are brought to the conclusion that the whole question is one of style and suitability.

SUMMER HOUSES

To deal first of all with summer houses, or, as they are often called, garden houses. Formerly these were usually constructed of brick or wood, but the modern building mediums—concrete and steel—are becoming increasingly popular in this sphere. These last are usually most effectively used near the house, and then only if this is built of similar materials.

An excellent way to do this is to continue one of the house walls, usually that on the north, out towards the east or the west for a distance of say twenty yards and at a height of from five to six feet. The wall is then turned at right angles and continued to a point parallel to the south wall of the house, and in this wall the garden house is built. In this way a real garden room, open only to the south, is obtained. If then a border be run along the wall, the same width as the garden house, and,

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after a paved path has been laid, the centre area be devoted to lawn and a rose garden, or perhaps a pool, a most delightful sheltered patio will result. The whole effect will be specially beautiful if the walls themselves be roofed with the same material as the house, which to-day is often green tile.

In exactly the same way may an extra garden room be added to a brick and red-tiled house. In this case the wall and house would be constructed in brick.

If a wooden house is desired it should not be placed too near the house unless, as is rarely the case nowadays, the latter be of wood. The choice of type and style here is almost unlimited. One thinks immediately of brick-based houses with formal walls and roof, of elm-boarded thatched structures, and of rustic ones providing a warm and cosy harbouring place for earwigs!

The choice of type in a wooden house depends definitely upon the site it is to occupy. If near the house it should be formal in character, reasonably plain, and unostentatious. It may, however, be thatched, or have a wood shingle roof, although unfortunately both of these materials are rather expensive. Such a house might also have white-painted windows and doors capable of closing it completely.

A wooden house in an informal part of the garden may be less formal in character—it may very well be of the rustic type—although these harbour insects and the rustic poles are therefore best peeled if choice flowers or plants are nearby. This does, however, detract somewhat from the beauty.

Often a very delightful effect may be obtained by building a garden house over a stream or a narrow pool, thus making of it a kind of bridge. The sound of rippling water beneath the floor will be found very enchanting, while the house will remain beautifully cool.

In placing a garden house a more commanding view of the garden may usually be obtained by setting the structure upon a raised platform of paving or cement, somewhat wider than the house itself, and forming a step or terrace to the house. In a very commanding position in a large garden two or even three steps may advantageously be made.

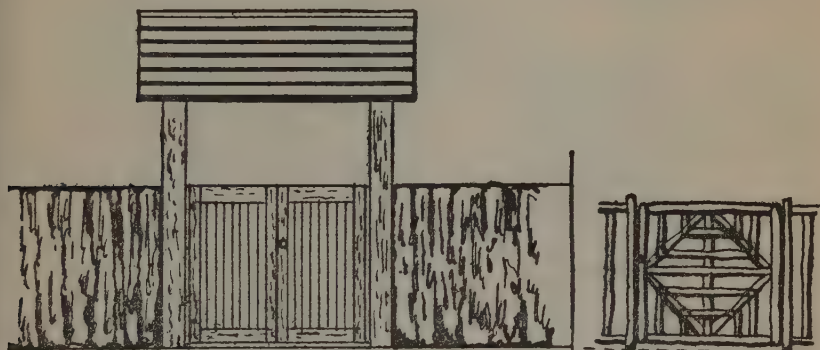
GATES

Gates may of course be included under our heading. Nothing can so make or mar a garden, and in scarcely any other feature is there so wide a choice. As it is the first one seen when visiting a garden it cannot be wrong to consider at the outset the entrance gate. It should combine dignity with welcome, and invite the passer-by to tread farther and explore the many delights which the garden has to offer. It should harmonize with the house and direct the attention towards the main door.

ARCHITECTURAL FEATURES

For dignity and tastefulness few gates can surpass a wrought-iron one, either copied from some old Italian or Spanish masterpiece—if it is not possible to have a genuine example from one of these countries—or of some pleasing, simple design which has character and, what is very important, a motif.

Another type of gate which is becoming increasingly popular is the lych-gate. Less deep than those one usually associates with churches, their roof is seldom more than two to three feet wide, and is as a rule supported by the two gate-posts, which are continued higher for this purpose. Here again the best effect results from using the same material for its roofing as is used upon the house. In a lych-gate scheme one



Here is a design for a wooden lych gate and a rustic gateway. Both could quite well be home made

finds that the entrance is most attractive when the gate itself is not more than three feet high.

Have you ever seen a Chinese moon-gate? There are few gates more attractive. The idea is of course the circular moon-shaped opening,—we must therefore think of the moon when at the full—and very often there is no actual gate at all. For this reason a moon gate is most suitable as a connecting link between different parts of the garden, while the most suitable medium for its construction is usually brick or stone.

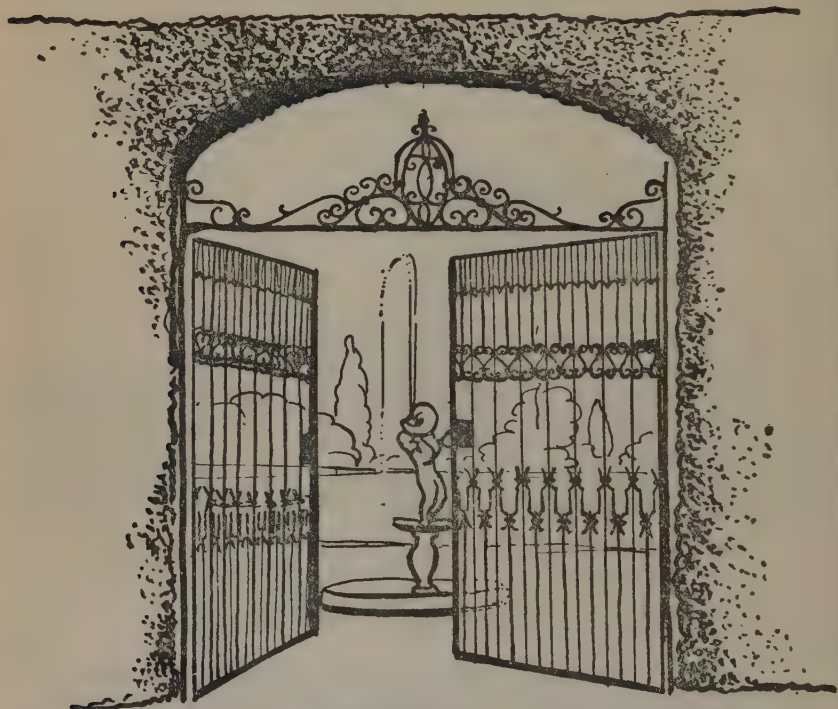
Wooden gates can be made very attractive, and there are many forms from close-boarded to rustic ones, all of which can be made beautiful. If oak or teak is used, never creosote it, or give it any other treatment, but leave it to develop that beautiful mellow appearance that speaks of age and solidity. Both of these woods take on the most delightful hues when exposed to the effects of Mother Nature, and neither needs protecting from the weather.

Gates could, in fact, be used much more in gardens than they are.

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To view a sparkling fountain through a beautiful wrought-iron gate set in a dark yew hedge is a very charming experience, and when one has a rose garden enclosed by a hedge a more friendly and intimate appearance is given it by placing a gate at the entrance.

The dimensions of a gate are very important. Two feet six inches is the minimum width, and, unless the gate be square, the height should



WROUGHT IRON GATEWAY IN YEW HEDGE.

A garden gateway should have some focal point of interest beyond it, if it is of the openwork type

be either considerably greater or considerably less than the width. A gate which is almost square, but not quite so, is never pleasing; so of course is one whose size is disproportionate with the size of the garden. If the opening is to be more than 3 ft. wide double gates are usually more suitable, especially if they are of iron.

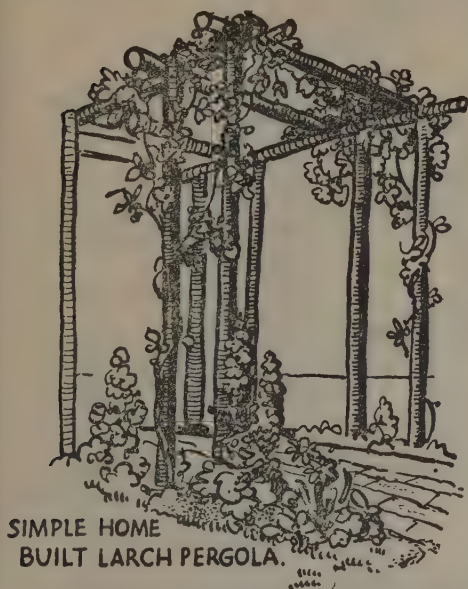
The posts should be firmly fixed in the ground to a depth of at least two feet. It is difficult to prescribe definite rules as so much depends upon the weight and width of the gate and the nature of the soil. Very heavy gates should be hung upon posts set in concrete.

ARCHITECTURAL FEATURES

PERGOLAS

Although primarily designed to provide a dry walk in a garden, a pergola offers great possibilities in design, besides affording great facilities for the growing of such beautiful climbing plants as roses, vines, wistarias and clematis.

The first thing to remember when a pergola is designed is that it must lead to somewhere or something; if there is no existing feature to which it connects, some such object as a figure or a particularly out-



SIMPLE HOME
BUILT LARCH PERGOLA.

SOLID STONE PERGOLA
WITH HEAVY TIMBERS.



Pergolas can be made in various materials—wood, stone or brick—and care should be taken to choose a design which will be in keeping with other features in the garden

standing display of colour must be provided. A pergola which leads to nothing in particular loses half its interest.

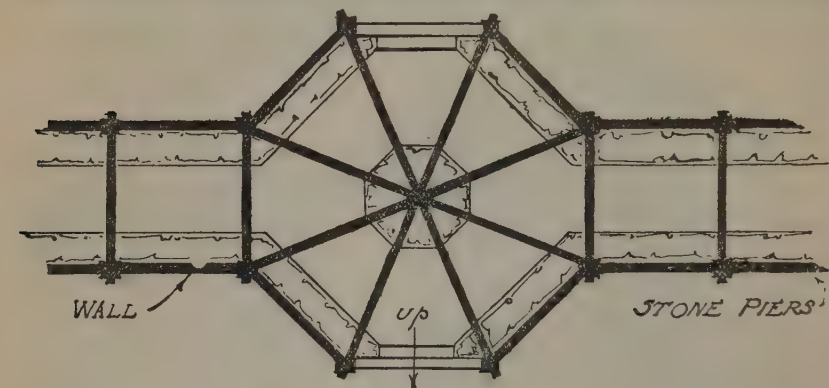
There are many materials which can be used for constructing a pergola. Formal and very effective ones can be made with brick or stone piers and timber crosspieces. The piers in this case should be not less than fifteen inches square and seven feet high, and the distance between them from seven to eight feet each way. If from the end view a pergola is not square the width should, for the best effect, be greater than the height. When the piers are of stone or brick small rock plants can be grown in them by leaving out a brick or stone here and there; this will help clothe the pergola and considerably enhance its appearance. The rails connecting these piers should be about nine inches by four, and

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placed on, and the cross-pieces four inches by six inches, and similarly placed. These latter are best placed about two feet apart.

A pergola constructed solely of timber—and for this purpose oak or teak are best—can be very effective indeed. Nine-inch square posts are for this type sufficient, and the dimensions of the other parts may be the same as those given above.

The merest amateur can construct his own little pergola of larch or pine poles with a minimum of expense, and the result may be, and often



LARCH POLES.

A sunken path under a pergola makes an interesting garden feature, especially if it is flower bordered. In both plans the uprights are eight feet apart

is, quite beautiful. When this rough wood is used it is best to peel it, so that insects are not harboured.

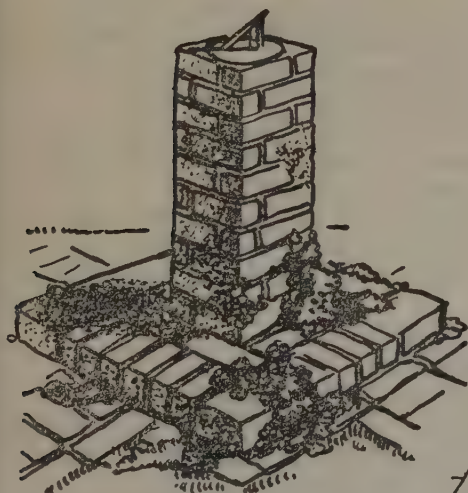
When the climbers on a pergola are well established the walk becomes very shady, and this, with their continual drip in rainy weather, prohibits the successful cultivation of grass beneath the pergola and renders the walk very damp so that the whole object of the pergola is lost. It is therefore wise to make the path of paving or stone. However, to avoid the appearance of too much stone it is usually satisfactory to have a four-feet-wide paved path down the centre, with grass on either side, or to place stepping-stones down the centre.

ARCHITECTURAL FEATURES

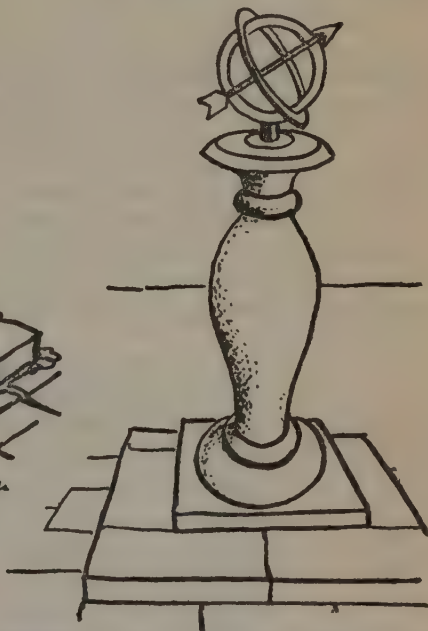
PLEACHED LIMES

It is very possible to form a natural living pergola of beech, lime, or hornbeam if time is not the chief factor. The trees require careful training—for which a light wooden and wire framework is necessary—and probably from twelve to fifteen years will elapse before the object is achieved. By this time, however, the result will be so charming, and the walk so cool and fresh, that one will feel that the years of waiting were well worth while.

A DUTCH SUNDIAL



**A HOME MADE BRICK
SUNDIAL**



A brick sundial can be made at home. Use a soft-coloured brick. A more formal Dutch sundial gives dignity to a garden layout

SUNDIALS

In addition to the common pedestal sundial there are two other types. One is the Dutch, or armillary sphere, the other the wall sundial. The former is composed of three metal circles, joined to form a sphere, and a metal rod forming an axis through the centre. On the inside of one of the circles the hours are marked, and the shadow of the axial rod is cast upon these figures. Wall sundials are very attractive upon the wall of a house or garden; they are usually much larger than the pedestal ones and are often as much as two feet six inches square.

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A sundial should always be placed in a quiet and restful part of the garden; it gives a greater sense of restfulness and seems to remind one that though life has its worries time bears them away. Never make the fatal mistake of placing a sundial where it will be overcast by the shadow of a neighbouring tree or building. This may seem a needless warning but it is often done.

For some reason a sundial seems to fit in with a rose garden better than any other form of statuary; the two features seem to be natural complements of each other, and a dial as the centre piece of such a garden seems always a happy thought.

Sundial pedestals are obtainable in cast or carved stone and in a great variety of designs, but apart from these, very charming ones can be constructed of old brick or similar material, leaving out a brick here and there and planting in the spaces rock and trailing plants such as *Aubrietia* and *Limnantes Douglasii*—the latter grown from seed as an annual. For an old brick sundial a base three feet square and one brick deep, surmounted by a pedestal two feet six inches high and nine inches square gives a well-proportioned effective whole.

On a more formal sundial a small motto or stanza of suitable verse may often be inscribed, while often this is engraved upon the dial itself. Something of one's own choice is most suitable, but here are one or two pertinent verses:

"Serene he stands among the flowers
And only marks Life's sunny hours;
For him dark days do not exist,
The brazen-faced old optimist."

"I have no sound, nor voice, yet by the light
Of sunbeams touched, I tell the hours afloat."

"I count no hours that are not bright."

"Time as he passes us, has a dove's wing,
Unsoiled and swift and of a silken sound."

The setting of a sundial is very important. This is best done early in the day, and, having seen that the top of the pedestal is perfectly flat and level—a spirit-level is essential—remove the three studs from the plate, place the latter upon the pedestal so that it shows the time correctly to within a few minutes, mark on the pedestal through the stud holes, and remove the dial. Next cut three holes in the pedestal where marked about twice as long as will be necessary to accommodate the studs so that the dial at the present has plenty of play round its centre. Into these holes run some thin neat cement and replace the dial with the studs. Now from an equation table ascertain the difference between solar and mean time, set the dial to show this true solar time, and allow the cement to set.

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It may seem from this that one must wait for the sun to shine before setting the dial, but this is not essential, for a sundial may be set with the aid of a compass. Cut out the holes, fill with cement as before, and replace the dial with the compass upon it. The compass needle should not coincide with the north point upon the compass, but with the magnetic variation, which is ascertained by referring to any ordnance survey map. When the gnomon is pointing towards the north the dial is set.

EQUATION TABLE

Showing the difference between Solar and Mean Time.

Jan.	Feb.	March	April	May	June
Days Mins	Days Mins	Days Mins	Days Mins	Days Mins	Days Mins
2Fast 4	3Fast 14	4Fast 12	1Fast 4	2Slow 3	4Slow 2
4 5	20 14	8 11	5 3	15 4	10 1
7 6	27 13	12 10	8 2	28 3	14 0
9 7		16 9	12 1		20Fast 1
11 8		19 8	15 0		24 2
14 9		23 7	20Slow 1		29 3
17 10		26 6	25 2		
20 11		29 5			
24 12					
28 13					

July	Aug.	Sept.	Oct.	Nov.	Dec.
Days Mins	Days Mins	Days Mins	Days Mins	Days Mins	Days Mins
4Fast 4	4Fast 6	1 0	1Slow 10	11Slow 16	1Slow 11
10 5	12 5	5Slow 1	4 11	17 15	4 10
19 6	17 4	8 2	7 12	22 14	6 9
	22 3	11 3	11 13	25 13	8 8
	26 2	13 4	15 14	29 12	11 7
	29 1	16 5	20 15		13 6
		19 6	27 16		15 5
		22 7			17 4
		25 8			19 3
		28 9			21 2
					23 1
					25 0
					27Fast 1
					29 2
					31 3

Slow means that the watch should be slower than the sundial; *Fast*, faster.

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BIRD BATHS

Many of the remarks concerning sundials apply also to bird baths, and if you are a nature lover you will certainly have a bird bath in your garden. The number and variety of the birds who will then visit you will be amazing. Cheeky little tomtits, graceful water wagtails, robins, flycatchers, stonechats, will all make their home in the garden, and the good they do exceeds the evil. They will feed upon slugs, green-fly, and countless other garden pests, and make the garden resound with their song and merriment.

As focal points in design, bird baths are very valuable, as they can be obtained in a legion of designs and can be used where a sundial is



A SMALL STONE BIRD BATH WITH SMALL JET FOUNTAIN.

A small bird bath with a fountain jet can be made more interesting by planting a few groups of dwarf shrubs in the vicinity

impracticable by reason of shadows cast by adjacent objects, and where something less expensive than a figure is required.

BIRD APPLIANCES

Birds may be catered for in many ways besides the provision of baths. Nesting boxes, fat, coco-nuts, peanuts, swings and tables are all appreciated, and when the food is placed near a house window it is very enjoyable to watch the little tits hanging on to coco-nuts or hanging upside down in a fat container.

Many of these appliances are patented and are very good indeed. In price they are moderate. The warmest bird tables or cotes are those thatched with leather and may be either portable or simply fixed by driving the post into the ground. It is of course during the winter and early spring when birds are most appreciative of food given them, but they will stay around the garden the whole year through if they are encouraged when they find difficulty in procuring food for themselves.

ARCHITECTURAL FEATURES

DOVE COTES

In Norman and mediæval times, doves or pigeons were housed in enormous high towers, rather like windmills, which accommodated thousands of birds. Present-day gardens do not permit of such extensive fanciership, but nevertheless a few pigeons in a well-constructed cote can add greatly to the charm of a garden, and if well-fed and *provided with grit*, pigeons will neither do harm to garden or to the house walls.

An old-English atmosphere may be given a garden by placing a cote in the centre of a paved, gravelled, brick or cobbled courtyard, dotted here and there with low-growing plants, and planted in the corners with clipped box, yew, or some deciduous tree, such as lilac or quince or medlar, which develop a gnarled appearance.

Dove-cotes should be constructed of thick wood, and be absolutely waterproof, or the doves will not inhabit them. Where, as is usually the case, numerous entrances are provided, they should lead to separate compartments, so that the whole cote is a block of self-contained flats!

There are many designs for dove-cotes, but here, as in most garden features, simplicity is best. Where the centre post is not set in the ground the base should be sufficiently heavy to ensure that the cote is not blown over.

A wall-cote upon a sheltered wall could be constructed of thinner material than that exposed upon a pole to the fury of the elements, but they are less arresting as central features in design, although two broad herbaceous borders may very effectively lead up to such a cote.

STATUARY

The Italians were the pioneers of garden statuary and figures, and they showed their ability in this as in other forms of Art. In Italy most of the figures were in marble, but this material is not suitable for our country and stone or lead are better mediums for construction.

An original design is usually very expensive, but quite charming figures may be procured very cheaply owing to mass-production. These figures portray many types, some, like Pan, are bright and jolly, some are just beautiful, and others grotesque. These last do find their place in gardens, but for the most part they give less lasting pleasure to those who live with them than do those expressing gaiety, life, or meditation.

Lead figures "weather" beautifully, taking on a very lovely hue, and of course never wear away. Artificial stone ones, however, although they often become coloured, sometimes flake badly. An assurance from the maker that a figure will not disintegrate is usually sufficient to dispel the purchaser's fears upon this score.

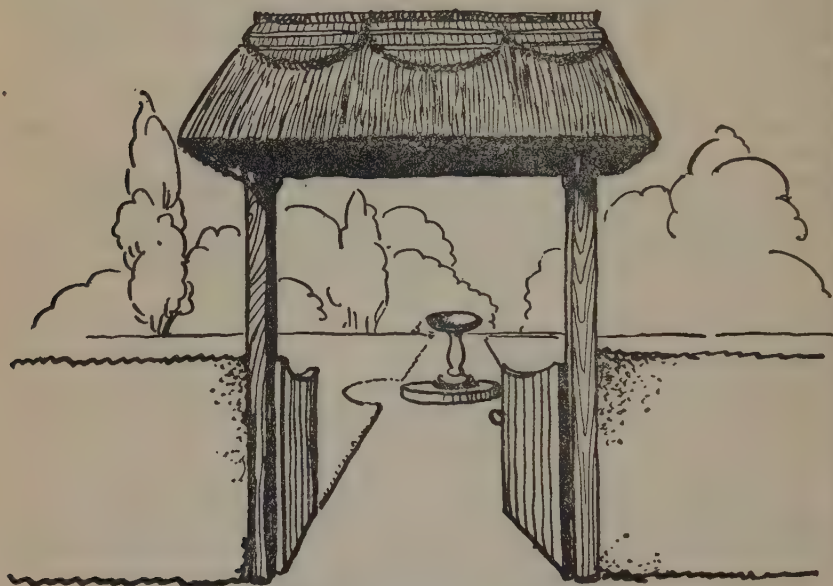
When choosing a garden figure, consider the site it is to occupy and try to decide on the size and style best suited to the position. You

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should know before entering the shop, or consulting the catalogue, exactly what type of figure you require; what mood it is to express. Haphazard choosing is fatal. Again, a figure should always be placed for some purpose—to provide a focal point in a design, as a foil against a contrasting background, or at the end of a vista, to arrest the eye.

FURNITURE

Until comparatively recent years, stone and wooden seats were the only furniture used in gardens—and these two materials are still the



THATCHED LYCH GATE.

A thatched lych gate gives an old-world touch to a garden entrance and is specially suitable for the country cottage

best for permanent features, but to-day wickerwork, steel, and fibre are becoming increasingly popular, as for the most part they provide more comfortable seating.

Stone and wood are yet the only materials suitable for seats which are part of a design, and may convert a collection of flowers and plants into a homely corner. Stone seats are never very comfortable, but this does not prevent their being employed to provide a stately formal atmosphere, or in parts of the garden near the house when this is of similar material. Many old mansions have wide terraces provided with

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formal stone seats which give the place an atmosphere no other material would provide. Often these seats have no sides or back, being merely benches.

The style of few modern houses admits of the use of stone seats, and they are very expensive; wood therefore provides the best medium. Oak or teak should never be painted or treated with preservatives, but deal requires such treatment.

It is very uncomfortable to sit with one's feet in a pool of water, and a seat placed in a damp spot would be little used. Always place a seat, therefore, upon a paved platform sloping down a little towards the back, to prevent the wearing away of the lawn or gravel upon which it is placed and the making of unsightly holes beneath the legs.

Never place a seat in a position where no one would wish to sit, too near to a noisy main road or overlooking an unsightly view. Seats in the shade, for example, on the north side of a wall or hedge, are not always popular, for only in the very hottest weather does one wish to avoid all sun.

Among wooden seats some are suitable for formal parts of the garden and some for informal; a rustic seat might look very well in a wild garden, but it would be out of place in a sunken garden or near the house, unless this be wooden and thatched.

A seat placed in a wall recess is often best if raised upon a low platform, and such a seat should always be formal in character. A seat so placed has the advantage of being sheltered from cold winds and can be used early and late in the year when other seats are too exposed.

Painted white seats were much used at the beginning of this century, but they are less favoured to-day as they are glaring in appearance and not conducive to rest. Green paint is more suitable and tones well with the garden, while creosote and similar preservatives are excellent.

Occasional garden furniture is very popular to-day because it can be easily moved to meet the demands of the moment, and in no less degree because manufacturers are daily introducing new, well considered, and cheerful designs. Coloured umbrellas, steel chairs, fibre work, wheeled chairs, and swinging hammocks have a wide appeal, and moreover are very comfortable. Their portability enables them to be used in the loggia or sun-lounge during the winter and the design of the garden has not to be considered—comfort is the only consideration. Much of this furniture will fold and this facilitates storage in the garden house.

VASES AND TUBS

Vases and tubs provide the gardener with a means of maintaining a succession of colour in the garden by using them, as it were, in relays. When the bulbs and wallflowers are over, the tubs containing them are

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brought in and replaced by others containing geraniums or agapanthus. Formal trees such as standard bay or mop-head acacias may also be grown in tubs on a paved terrace and be very effective.

Stone vases are suitable in positions suited to stone seats, and any kind of tub or vase is best used in a formal part of the garden. They are specially valuable upon roof gardens and terraces, or upon either side of a formal seat.

Metal linings may be obtained for wooden tubs to preserve the wood, but these are not necessary in teak or oak ones although they save the staining of the wood where the soil and water percolate through the joints. All tubs should have drainage holes bored in the bottom.

Tubs may easily be made at home, while some of the most effective are made from empty wine casks cut in half, and painted green with black bands. These are most suitable for growing agapanthus and other plants which need plenty of room and they allow colour to be massed.

GREENHOUSES

Greenhouses, when they are used for raising seedlings and for other mainly utilitarian purposes, are usually relegated to the vegetable garden or service part, when their harmony of design is unimportant. A greenhouse devoted to the growing of beautiful flowers such as cyclamen, chrysanthemums and gardenias, however, needs to be near the house to be thoroughly enjoyed, and in this case its design is very important.

There are three types of glasshouses—the span-roofed, the three-quarter span and the lean-to. The former is an all-round house suitable for general purposes. The house should run from north to south and should have the door at the south end and the boiler at the north. To allow tall-growing plants like carnations to be grown, the height of the sides above the staging should be never less than $2\frac{1}{2}$ ft. unless the house be sufficiently wide to allow of a centre staging. The span roof should not rise immediately from the brickwork and staging even if the house be required solely for growing seedlings.

Three-quarter span houses should have a south aspect, and are useful against a wall when this is not high enough to take a lean-to. Such houses are warmer than span ones, as there is no glass on the north side.

The lean-to house is the simplest and most easily constructed, and is therefore less expensive. Like the three-quarter span it should face south and the roof should have a good fall.

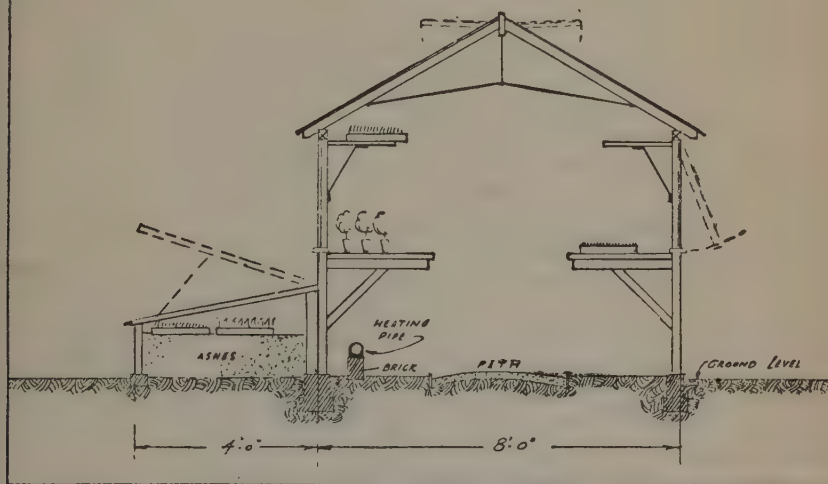
Greenhouse staging may be of lattice work or of pebbles or coke laid over a solid staging. Coke retains moisture whereas lattice work does not. In a span-roofed house staging is placed along both sides and, if the house is wide enough, down the centre. It is very important that the staging be wide enough to make the plants at the back easily acces-

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sible for watering and attention. The three-quarter span and lean-to types allow staging to be placed in tiers, thus greatly increasing the capacity of the house and making full use of the available space.

The ventilation of a greenhouse must receive great attention. The usual method is to have lights in the roof, in the sides also in span houses, and ventilators in the brickwork below the staging in all types. These

SECTION THROUGH SMALL GREENHOUSE
E FRAMES - SHOWING HEATING



A small greenhouse and frame, if carefully managed, are a great asset to the gardener. Seedlings can be raised and flowers grown for the house through all months of the year.

are very important as they change the air in the lower parts of the house and help to circulate moisture.

In the summer, glasshouses should be shaded by using blinds of the chain and lath type inside the house, chinese blinds outside the house, or by spraying the glass with whitewash or with some patent green-shaded preparation. Do not forget, too, to collect the rain-water inside the house.

Low-pressure hot-water systems are most usually used for heating glasses, although a small stove is often satisfactory in a small house. Oil is used in very large houses, while electric tubular heating, thermostatically controlled, is becoming very popular for houses of any sort.

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Gas too is used, and although these and electric systems are more expensive to run, they take care of themselves, and, needing no attention, save a deal of labour.

One house may be divided into two or more sections by using partitions, and valves in the water-pipes. This enables different temperatures to be maintained in the separate sections and makes the house much more useful.

FRAMES

The Cold Frame.—A useful cold frame for the small home garden is one with a sash of six by four feet. If a two-light frame can be used, far more can be done in the way of raising seedlings and sheltering winter plants. The frame should usually be about 18 in. deep at the back and sloping down for 4 or 5 in. to the front.

In association with the frame a hotbed can be built up to make it possible to raise seedlings requiring heat in the early part of the year. It should be remembered, however, first that a hotbed needs fresh stable manure and continual stores of supply so that the heat can be maintained, and also that plants raised in a hotbed will be tender and will need hardening before they can be planted in the open garden.

If only one frame is available, therefore, it should be treated as a cold frame and not as a hotbed. To make a hotbed, fresh stable manure with strawy litter and leaves are stacked together and turned at intervals of two days while the manure is very hot. After a week or ten days the manure should be ready for use and should be built up into a bed 3-4 ft. deep, and wider and longer than the size of the frame, so that there is an 18-in. width round the outside of the frame. After this the frame is set in position. When the temperature has dropped to about 75°, soil is filled in, about 5 or 6 in. deep, all over the bottom of the frame.

Seeds should not be sown immediately in this soil while the temperature is still high. The usual practice is to use seed boxes filled with ordinary compost and to stand them in the frame, raised on bricks, so that air circulates all round them. By the time the seedlings in these boxes have germinated, the temperature of the hotbed will have declined sufficiently to allow the seedlings to be pricked out direct in the soil of the bed. When the temperature of the inside of the frame drops, more fresh stable manure must be piled round the sides, and renewed from time to time in order to keep a fairly even, warm temperature round the seedlings.

Of the plants that can be grown in frames there are a good number suitable for indoor decoration as well as plants raised for kitchen use. They are, of course, the half-hardy annuals—which are sown in the frame

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in the early part of the year, and after hardening off are transplanted to the open garden—and these include such things as Stocks, Asters and Zinnias.

The frame is also used for bulbs during the early stages, the bulbs being brought later into the warm greenhouse or to the living-room. The frame can, however, also be used for plants of Cinerarias, Primulas, Begonias, Cyclamen, Fuchsias, and such bedding plants as Calceolarias, Geraniums, Carnations, and so on.

Frame culture is also a useful way of growing tomatoes, cucumbers and other slightly tender kitchen crops in cold, exposed gardens. When tomatoes and cucumbers are grown, bamboo canes are usually placed horizontally across the top and the plants tied to these as if they were ordinary sticks. The frame lights are removed during the hot summer. These are of course very useful in the early stages of the plant's life.

Greenhouse Management.—Several volumes could be written on the subject of greenhouse management and of the various plants which can be cultivated in greenhouses in the small garden. However, the common type of greenhouse is one which is designed to hold a variety of plants; and the problem for the amateur to decide is usually what plants he will grow together in his limited space and with limited heat, for obviously the single greenhouse cannot be a stovehouse. As a rule, the Orchid family and most tropical plants are not found in the single greenhouse. They need constant syringing at certain seasons and the atmosphere maintained for their health is undesirable for many of the commoner plants grown by amateurs. If the greenhouse is just used for raising seedlings and wintering rather tender plants, the decorative appearance is best maintained by using the commoner plants such as Schizanthus, Torenia, Browallia, etc., and the nearly hardy plants such as Amaryllis, Lilies and Cyclamen. In a brief description of popular greenhouse plants—at the end of this chapter—particulars will be given of the requirements of each: and the amateur will be left to draw his own conclusions as to which are the best for his particular purpose. The best advice that can be given is to avoid attempting too much. A cool greenhouse can be made exceedingly attractive by the judicious selection of plants suggested here, and at the same time it can serve a double purpose. That of housing seedlings and cuttings and in starting growth.

A *profitable* method of using a small greenhouse is to grow winter-flowering Carnations, followed by a Tomato crop in summer and Chrysanthemums in the autumn. They fit in with each other so that the major part of the space is occupied by each crop in succession.

As an alternative, the greenhouse may be made a continuous centre of interest and admiration, if a suitable selection of plants is grown to

make a special show for each successive month. Thus, when January's sweet-scented Hyacinths and Lilies of the Valley fade, February's Tulips and Daffodils are in their glory. The dainty Azalea and Laburnum of March give way to the deep blues and purples of April Cinerarias and Gloxinias.

May is ushered in with a fine show of Calceolarias and Schizanthus, the velvet bees and dainty butterflies of the flower world. June's gay Begonias and scented Lilies are followed by the dainty coolness of Campanula Pyramidalis, or the fragrant fresh Carnations.

The August show might be heavy-headed Fuchsias and upstanding Amaryllis; in September Pelargoniums, the flaunting beauties of the series are in their prime, and the lovely crimson and cerise of the hot-house Cyclamen, or the Poinsettia's painted leaf vie with the rich outdoor colouring of October.

Chrysanthemum the Golden brings into November's dull days a summer glow that fades into the snowy purity of December's Narcissus and Roman Hyacinths, thus ending the year with a promise of spring.

Potting Soil.—In greenhouse management one of the most important things is to keep a supply under cover of the following materials.

Seed-sowing compost is best made of three parts fibrous loam, one part sharp sand and one part old, decayed leaves all well rubbed through a fine sieve. To this mortar rubble or lime can be added. In most cases the leaf-mould can be omitted entirely. Potting soil is varied according to the type of plant, remembering that a good number of the greenhouse plants require peat, some require sphagnum moss, and, in most cases in preparing soil for pots, sharp sand is used. It is therefore advisable to keep a stock of all these materials and also some broken charcoal and lime-stone chippings. All these are required at times in the greenhouse.

Pots, in various sizes, should be kept clean in readiness for use. Every pot after being once used should be scrubbed with disinfectant soap and water and allowed to dry before being used again.

Seed Boxes and Pans.—These should be kept clean in readiness for use, and a supply of broken crocks, pieces of broken pot, broken brick, etc., should also be kept, as these are wanted in all potting operations. Labels and indelible pencil, a syringe, canes for training and a long-spouted can for watering, are other essentials for greenhouse management.

It is advisable, wherever possible, to keep all the materials used, in the greenhouse or under cover as close to the greenhouse as convenient, partly for ease of working and partly because soil, pots and so on should be used at the same time that seedlings are being pricked out and potted on. The slight check of putting a tender seedling into ice-cold soil might easily be fatal.

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The Propagating Frame.—In most small greenhouses a propagating frame is useful.

In this cuttings can be kept in a close, damp atmosphere during the time that the roots are forming, whereas if they are in the greenhouse difficulty may be experienced in keeping them uniformly moist.

Propagating frames are made in various shapes and sizes, according to the type of plants to be grown. They are merely miniature portable greenhouses.

Abutilon.—These greenhouse shrubs should be grown in two parts loam, one part peat and half-part sand in a sunny position. The varieties include *A. Darwini* and *A. megapotamicum*, with orange and yellow flowers. They should be increased by cuttings kept close in a propagating frame.

Achimenes.—Tuberous-rooted plants with flowers of white, red or blue. The tubers are started into growth in heat in spring, and can be grown during the summer in pots or in hanging baskets. When leaves die down, the tubers are stored in sand in a frost-proof place. They can be increased by root-division, leaf-cuttings or by sowing seeds.

Agapanthus.—Fleshy-rooted perennials with blue or white flowers, commonly known as South African Lilies. They make excellent plants for ornamental tubs and can be housed anywhere during the winter where actual frost can be excluded. Increase by division in spring. These plants are particularly suited to the ornamental conservatory where no heat is employed.

Agathæa.—The “Blue Marguerite.” These are grown from cuttings taken at any suitable time, and inserted in sandy soil. They are sometimes used for carpet bedding. In pots, they prefer sandy loam with leaf-soil.

Aloysia.—Is the well-known lemon-scented Verbena. It is grown easily in pots of light loam with leaf-soil, and can be increased by cuttings taken whenever convenient, and inserted in the propagating frame.

Araucaria.—The Norfolk Island Pine. (*A. excelsa* is the best known of this genus.) It is commonly grown as a house plant and can, if desired, be increased by cuttings inserted in a propagating frame in heat. Re-potting should be done in early spring if necessary. Soil of two parts loam, one part leaf-mould and one part sharp sand.

Asparagus.—The species *A. Sprengeri* is commonly used by florists. So also is *A. medeoloides*, which provides the trailing foliage which they usually call smilax. Both of these like loam and leaf-mould. Increase by seeds sown in spring, or by division.

Aspidistra.—Aspidistras are usually called “palms” or “ferns” by hawkers, but are really plants of the lily family. They are particularly

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suited for room culture, and will flourish even in the darker corners of the room, where few plants will thrive. When re-potting is necessary it should be done about March, when the new growth is appearing, using sandy loam and leaf-mould. It is really best not to allow plants to produce the flowers which sometimes appear at the soil level. After re-potting, *Aspidistras* benefit for a short period in a warm, moist part of the greenhouse.

Azalea.—Plants that are bought in full bloom in pots have usually been forced into flower by nurserymen. They can, after flowering, be re-potted into pots slightly larger than the ones in which they have flowered, and the plants syringed daily morning and afternoon, to encourage new shoots. At the end of June they are best stood out in the open air in a sunny position in order to ripen the shoots, so that they produce flowering shoots for next season. On the approach of cool days they can be brought into the greenhouse again, and should flower annually if treated in this manner. Occasional doses of weak liquid manure can be applied after watering. This will encourage the growth of new shoots during the early part of the summer.

Begonia.—(See CHAPTER III for the cultivation of bedding Begonias.) The large-flowered, tuberous Begonias are most decorative for use in the greenhouse. Their cultivation is no special difficulty; in fact, in the ordinary amateur's greenhouse they can be treated in much the same way as a *Dahlia*, that is, started into growth in gentle heat in spring, and June onwards grown without any artificial heat. They are sometimes used as bedding plants, but make very decorative potting plants. In autumn, when the foliage dies back, the tubers are stored in sand in a frost-proof shed. These Begonias are of all shades, and some of them have wonderfully frilled flowers of very varied form.

Fibrous-rooted Begonias grown in the greenhouse are also extremely decorative. One of the best-known hybrids is *Gloire de Lorraine*, which is a sterile hybrid and is increased by cuttings, but numerous others are listed in trade catalogues. Fibrous-rooted Begonias are raised from seed sown in a temperature of 60° F. in January. The large-leaved Begonias (*Begonia Rex*), grown for the beauty of their variegated leaves, are often increased by leaf-cuttings.

Another class of Begonias which can be grown effectively in the small greenhouse is the basket Begonia, *Begonia pendula*. This can be planted in baskets lined with moss on the inside, with a layer of turfy loam or grassy soil over the moss, and filled in with the ordinary Begonia bedding soil; that is, with a mixture of equal parts of loam and leaf-mould with a little dry cow-manure, silver sand and peat moss. All Begonias are thirsty plants and must not be allowed to become too dry at any time. They like to grow on to maturity with no check, and,

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so grown, they will provide some of the showiest of flowers for the greenhouse or garden.

Bougainvillea.—These are some of the showiest of greenhouse plants, especially suited for the cold house, since they require only shelter from frost. They can be trained over the walls or up pillars in the greenhouse to produce wonderful coloured masses of flower. The colouring is chiefly due to their rosy bracts. The soil for their cultivation should be two parts loam, one part leaf-mould and half-part sand. The plants should be re-potted or planted in the greenhouse border in February, and at the same time the previous year's growth should be cut back to within 1 in. of the old root. Very little water should be given during the winter. Increase by cuttings of new shoots taken off with a heel and inserted in sandy soil in spring.

Bouvardia.—Plants with white, red or pink flowers. Easily grown much the same as the common bedding Geranium. The soil should be two parts fibrous loam, two parts peat, one part leaf-mould and a little silver sand. They can be grown in the cool house with not too much water during the winter. In February they are pruned to within 1 in. of the old wood, and re-potted in March when necessary. There are some very showy double forms such as "Hogarth," double scarlet; "President Garfield," double pink, etc.

Cacti and Succulents (see CHAPTER VI).

Calceolaria.—Slipper flower.—Some of the showiest of greenhouse plants are the herbaceous Calceolarias. They are grown from seed sown in June, the flowers being produced the following May. Seed is sown carefully on fine gritty soil, and soon as possible the seedlings are pricked out into pots, and afterwards into a succession of pots gradually increasing in size up to 8 in. Water must be given with care, and liquid manure, particularly soot water, can be given occasionally with advantage. Keep a constant watch for green-fly, which is often very troublesome. (The plants should not be sprayed to cure an attack, but the greenhouse should immediately be fumigated.) The soil used for the final pots should be two parts loam, one part leaf-mould, half-part sand, with a little dry cow-manure. The showiest Calceolarias for the amateur's greenhouse are the hybrids such as *C. Clibrani* and Albert Kent hybrids.

Canna.—These are very useful as pot-plants in the greenhouse, being treated in the same way as Dahlias, *i.e.* started in heat in spring and stored as tubers in winter. They have flowers in shades of yellow, orange and red. Seed is sown in spring in gentle heat, with plenty of tepid water used in the seed pans. Seedlings are potted out into loam, leaf-mould and sand, with old manure. Good flowers can be expected from two-year-old seedlings. If the seed seems difficult in germination, the small portion of hard outer seed-coat can be filed off.

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Capsicums and Chillies.—*Capsicum annum* and *C. baccatum* are frequently grown in greenhouses on account of their decorative appearance. This genus of plants includes the well-known Sweet Pepper. Seeds are sown in light soil in a temperature of about 75° in February. Prick seedlings off into small pots and pot on as necessary until they reach 6-in. pots about May. The soil for the final pots should be three parts light loam, one part decayed manure with a good sprinkling of bone-meal and sand. Plentiful drainage must be provided in the pots and ample sunshine should be given the plants through the summer. They can, if preferred, be grown in the open and brought into the greenhouse in late autumn to finish colouring the fruits.

Carnations (see CHAPTER VI).

Chrysanthemums (see CHAPTER VI).

Clivia.—Evergreen plants with long strap-shaped leaves and showy flowers, in outline something like the lily. They can be raised from seed, which germinates readily in spring in heat. Seedlings are potted up singly in small pots and potting-on is seldom practised, as the plants will flower in very small pots quite successfully. The soil should be rich loam with sharp sand and charcoal. During the flowering period liquid manure is appreciated. Clivias make fine pot-plants for room decoration, and some of the newest hybrids are exceedingly showy. Of these the best are *C. Gardeni*, orange and red; *C. nobilis*, red and yellow; and varieties of *C. miniata*, such as “Distinction” and “Excelsior.” “Distinction” is orange, scarlet and white, and “Excelsior,” orange and red.

Coleus. Flame Nettle.—This is a greenhouse perennial sometimes used as a potting plant. It is usually raised from cuttings inserted in sandy fibrous soil and grown in a compost of two parts loam, one part leaf-mould, half part sand, with the addition of dry cow-manure. The plants should be pinched off occasionally to induce bushy growth.

Convallaria (*Liliaceæ*). Lily of the Valley.—Though actually a hardy herbaceous perennial, this plant is frequently brought into the greenhouse to force its lovely bells for winter use.

Its natural habitat is the limestone moss, and it is seen at its best in a garden when planted in a damp sheltered border between a brick wall and a flagged path, where it can be left undisturbed year after year, except for the addition of a little manure in February.

Forcing Culture.—Six or eight crowns are put singly in a 48-size pot, bulb fibre shaken between the roots, and covering them. This is well-pressed and the pots set in the greenhouse till flowers can be seen, then removed to the forcing-house. Better results follow the purchase of retarded crowns, and these may be potted and placed at once in the forcing-house. Once used, the crowns may be planted in the wild garden to naturalize. No second forcing is possible.

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They can also be cultivated as a greenhouse pot-plant; in this case 8-12 crowns are used to a 48-sized pot in a compost of one part fibrous loam, one part leaf-mould, and enough sharp sand to keep it open.

They are put in the cold-frame in October and brought into the greenhouse in January. Temperature 45°. There will then be a succession of bloom for a long period.

Propagation by division of roots.

Cordyline (*Dracæna*) or New Zealand Cabbage Tree.—These are the highly-coloured plants sometimes used in the open garden in mild districts, but more commonly grown as greenhouse plants. They give a distinct and tropical appearance to either greenhouse or garden. Ordinary greenhouse potting-soil is sufficient for the pots. Fresh plants can be raised from seed, and also by cutting stems into pieces and inserting them into coco-nut fibre and peat.

Cyclamen (see CHAPTER V).

Cytisus.—Commonly known as "Genista." It is raised from cuttings and half-ripened shoots inserted into the propagating frame at any convenient time, and should be cut back each year after flowering, and on alternate years should not be forced into early flowering, but should be grown on in cool conditions in the cold-frame or open garden to encourage new growth. After bringing the plants into the greenhouse, if forced, they should be syringed every morning and afternoon. Liquid manure is also advisable.

Datura (Thorn Apple).—Both annuals and shrubs. *D. arborea* flowers in the greenhouse in August, the flowers being white. *D. chlorantha* is available in several varieties, and *D. sanguinea* with orange-yellow flowers are mostly grown. The annual kinds can be raised from seed sown in heat in February or March, and are suitable for planting out in beds where a sub-tropical effect is desired, in ordinary sandy loam. Occasional doses of liquid manure are appreciated.

Erica.—Heathers of various kinds make fine pot plants for greenhouse decoration. They are not easily raised by amateurs, although cuttings can be struck in sand in a propagating frame. If it is desired to raise new stocks, the best thing to do is to obtain heath soil from land which naturally grows heather. This should be mixed with some sand, and used over plentiful crocks. *Ericas* can be also obtained from seed sown in sandy peat in spring. Cuttings can be taken in July and August.

Erythrina, Coral Tree.—These are semi-woody, deciduous shrubs with flowers like waxy sweet peas, scarlet in colour. Stocks are started in heat in spring, and the plants grown on in pots in an ordinary cool greenhouse during the summer. They can if preferred be planted out in borders, like dahlias, and are increased by seeds and cuttings in the new shoots in the same way as dahlias.

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Eucalyptus.—Eucalyptus plants are sometimes used as bedding plants, and frequently as greenhouse decorative plants. They should be grown in compost of two parts loam, one part leaf-mould, one part sand and a little charcoal. It is best to raise plants from seed for pot-culture, sowing it in sandy soil at a temperature of 60–65°. *E. citriodora*, which has broken small rough leaves, is the best for pot-work, and makes a fine room plant.

Ferns (see CHAPTER VI).

Fuchsia.—Although a number of fuchsias are really hardy and can be grown all the year round outdoors, the majority of choice species are best grown under glass throughout the year, or at least during the cold weather. For greenhouse decoration they are often specially trained as standards on a single stem. Some are also grown in hanging baskets for greenhouse decoration. The varieties used for potting out are for the most part those with ornamental foliage.

Fuchsias are increased by seeds, layers or cuttings, cuttings being most used. Several young shoots are selected and inserted in sand in a propagating frame. As a rule these young shoots are taken off just after the plants are started into growth in the New Year. They need a temperature of about 60° to root. The top of the leading shoot is pinched out in order to encourage bushy growth, unless a standard is being trained, when of course the side shoots are pinched out and only the leader allowed to develop. Occasional doses of soot water and weak liquid manure made from animal droppings encourage the development of healthy plants.

In the case of a standard fuchsia, as soon as it has grown the required height the top of the leader is pinched out and laterals are allowed to develop from the top of the main stems. These laterals are treated like new fuchsia plants, that is, they are stopped now and again in order to make the growth more bushy. This results in the development of a fine head of flowers. Fuchsias under glass should be syringed frequently with tepid water. This both assists growth and also keeps down insect pests. Most fuchsias also require staking.

The worst pest of fuchsias under glass is the White Fly, and the best way to treat it is by fumigation of the greenhouse. Some of the finest hybrids for greenhouse culture are as follows:—Ballet Girl; Dainty Lady; Fascination; Heritage; Mauve Beauty; Royal Purple; White Phenomenal.

Gloxinia.—These are very showy plants usually grown in the warm greenhouse, though they can be quite successfully cultivated in a cool house. They are raised from seed in the same way as a Begonia, the seeds being sown in September and January, or again in April or June. They should be sown in well-drained soil, and watering should be done very carefully, as the seed is exceedingly fine. The plants are pricked out

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into small pots and moved on into larger pots by stages until they reach 6-in. pots. The soil for the final pots should be turfy loam with a little peat, charcoal and sand. Occasional doses of liquid manure are appreciated, but neither liquid manure nor water should be allowed to touch the flower buds. Gloxinias can be raised from leaf cuttings in the same way as Begonias (*see* CHAPTER XVI). Named varieties of Gloxinias are also obtainable as tubers. The tuberous root of the Gloxinia is stored in sand in winter in the same way as a Dahlia, and can be treated in much the same way in spring. Seeds of innumerable named varieties are offered in catalogues, some of the showiest being:—Her Majesty, pure white; Firefly, scarlet, and creamy white; Duchess of York, dark blue and white; Pink Beauty, and Royal Crimson.

Grevillea.—These are handsome flowering shrubs, one species of which is commonly grown for indoor decoration, that is *G. robusta*. It can be raised from seed sown in spring in heat in a peaty compost. Seedlings are potted up into 3-in. pots and into increasingly large pots up to 8 in. The final compost should be good loam with peat and sand. These plants are sometimes used for summer bedding.

Hedychium.—Showy tropical plants that can be treated in much the same way as Cannas. They are increased by division of the roots in spring, each being cut into portions, allowing two eyes to each. These are started into growth in sandy loam or coco-nut fibre, and potted up later into equal parts of loam, leaf-mould, and some sand and manure. They should have plentiful supplies of water all through the growing season. One of the showiest species is *H. gardnerianum*, which has yellow flowers and grows more than 5 ft. in height.

Hippeastrum.—Bulbous plants which are easily raised from seed, though the seedlings take three years to reach flowering size. They are sown in rich gritty soil in May, and pricked out into sandy loam and leaf-mould. Fully-grown plants should be rested during the winter, and restarted into growth in spring. They have long strap-shaped leaves, sometimes up to 5 ft. in length, and three or four flowers, occasionally 10 in. across, are carried on the flower stem. These plants are frequently called Amaryllis, and are nearly related to Hippeastrums. (Hippeastrums can be grown on more continuously than Amaryllis, which need a rest.)

Hoya, Wax flowers.—These are climbing flowering plants suitable for cultivation in the warm greenhouse, and should be grown in a compost of two parts peat, one part loam, and one part sand, with the addition of mortar rubble. They can be trained to the roof or pillars in the greenhouse, and like plenty of sunshine. Careful watch should be kept for the appearance of green-flies and mealy bug, and the greenhouse should be fumigated if they are seen. Water should be given frequently during the summer, but rather sparingly in winter. Increase by cuttings

of well-ripened shoots inserted in sandy soil in spring, in a temperature of 70°. The pink-flowered *H. carnosa* is the one most commonly grown.

Humea, Incense plant.—This is a greenhouse biennial with scented foliage and small, pinkish flowers. The plants are sometimes used for bedding out, but make good pot plants and, if allowed, reach a height of 4–8 ft. Seeds should be sown in spring or early summer to flower the following summer, compost for the flowering pots being leaf-mould, sand and bone-meal, together with good loam, all passed through a coarse sieve.

Hydrangea.—The hydrangea of the greenhouse is the *H. hortensis*, and its hybrids. These are deciduous plants, fond of moist situations, and natives of China and Japan. They are easily increased by cuttings, which should root in sandy soil in February or March. As soon as rooted they should be potted up into pots of two parts loam, one part peat and one part leaf-mould, with some sharp sand. As they are potted on, more loam is included in the potting-soil in proportion. Cuttings can also be taken in autumn and rooted in a temperature 40°, and kept away from frost all winter. As soon as the plants have finished flowering, the old wood is cut back a little, leaving the strongest-growing new shoots for next season's flowering. At the same time the quantity of water given is decreased a little. When new growth begins, the water is gradually increased and the plants in their pots can be stood in the garden for the remainder of the summer.

The natural colour of the hydrangea is pink, the flowers only turning blue when they are specially treated, although some soils will produce the blue flowers, because of mineral contained in the soil.

In order to turn pink hydrangeas blue, they must be given regular treatment for a considerable period; the easiest way for the amateur to obtain results is to buy blueing powder from a florist, and to add a half pound of this to each bushel of soil used for potting. Subsequently the plants are watered every alternate week with water in which blueing powder has been dissolved at the rate of a half ounce to a gallon. In August a little extra blueing powder should be mixed into the surface of each pot-plant, so as to intensify the colour for next season. If blueing powder is not bought, the blue flowers can be produced by planting in a soil free of all lime, and by watering freely with three ounces of aluminium sulphate to one gallon of water. Pink-flowered hydrangeas are improved in colour by dressing with sulphate of iron broken up into small pieces and put on the soil of the pots. Of the modern hybrids of hydrangeas the following are some of the showiest:

BLUE PRINCE.—A strong, compact grower with medium-sized truss. Free flowering. Original colour is a rosy-pink, but treated for blue it is a striking, almost Oxford blue.

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H. J. JONES.—Deep carmine-rose, the richest-hued hybrid in this colour.

MADAM A. RIVERAIN (blue).—Natural colour light pink. Treated, it is a bright, almost Cambridge blue.

MARECHAL FOCH (blue).—This variety blued is most remarkable, no two plants blueing quite alike, but all having lovely shades of metallic-blue, shaded old rose.

NEIGE ORLEANAISE.—A pure white variety, and forms an immense truss of fine quality. Lasts in good condition a long time.

QUEEN MARY.—Soft rose pink, frilled edges.

Iresine.—These are stove or half-hardy ornamental foliage plants, which were very popular at one time for carpet bedding. They are raised from cuttings of new shoots inserted in sandy soil in early spring in a temperature of 70°, and grown on in a compost of leaf-mould and loam. They like sunny, warm positions, and should be repotted in early spring. The showiest are *I. Herbstii*, dark crimson foliage, and *I. H. aurea reticulata*, with gold and red leaves.

Iris. See CHAPTER VI.

Isolepis.—This is a grass-like plant which is often used to cover the greenhouse stages beneath taller plants. It is easily increased by division in early spring and will grow in ordinary loam with leaf-mould.

Kalanchoe.—Easily raised from seeds or cuttings and grown in equal parts of loam and leaf-mould, with sand, in well-drained pots. They need a warm house during the first year, but during the second year they can be grown a little cooler. They should be flowered in pots 6 in. in depth. *K. flammea* is one of the best species, with large heads of orange flowers, sometimes 1 ft. across.

Kentia.—The indoor palm is one of the commonest of foliage plants for living-rooms. It can be raised from seed sown in sandy peat, and covered with 1 in. of soil in a temperature of 70° in early spring. The plants should be repotted when necessary, in early spring, into pots well supplied with crocks at the bottom, with a compost of equal parts, loam, peat and silver sand. If a room plant becomes at all unhealthy looking, it is best to give it a rest period in the greenhouse if possible. If the foliage turns yellow, a small lump of sulphate of iron on the surface of the soil will remedy this.

Lachenalia (*Liliaceæ*).—Commonly called Cape Cowslip. Bulbous plants, free flowering and of graceful growth. Can be grown four or five bulbs together in a pot on a sunny shelf—or more round the edge of a hanging basket. Potted in August, in a compost of three parts of fibrous loam, with one each of sharp sand and leaf-mould, they will produce their flowers in May. At this time they will need a little liquid manure. They are durable vase flowers, and those of *L. Nelsoni* are

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particularly handsome, rich yellow, tubular flowers, drooping from stalks a foot high.

Laelia (*Orchidaceæ*).—A Mexican plant named after Laelia, a vestal virgin; the flowers are delicate rich-coloured blooms. Culture.—Compost of Osmunda fibre with a little sphagnum moss. Re-pot when roots are pushing from the base of the last made growth. Half fill the pots with clean crocks and set the plant so that it is lifted well above the rim of the pot. Water during growing time, then give more air and less water. Temperature should not be less than 60° at night nor more than 80° by day. Divide the plant when re-potting, if required.

Lagerstroemia (*Lythraceæ*).—A popular greenhouse evergreen with large panicles of numerous flowers, pink or white.

Propagate by cuttings of strong side shoots. These should be planted in sandy soil in bottom heat until rooted, when a cooler position is needed. Plants are better grown in a border in a greenhouse, to have overhead space. They should be freely watered during summer, and even in the winter never allowed to dry off. Pinch back young plants to make them bushy, and when potting put them in firmly. Cut mature plants back in winter, and any thinning out that is required can be done in spring.

Lantana (*Verbenaceæ*).—Introduced from S. America in 1692. Heliotrope-looking plants with verbena-like flowers in numerous colours. Take short side cuttings at the end of the flowering season, and root in gentle heat. Compost for planting two parts of loam, and one of peat or old manure from a mushroom bed, with some sand. Cuttings taken in autumn are struck in 3-in. pots. Later, after they have been pinched back, transferred into 6-in. pots. They can also be cultivated from seed, and can be used for bedding plants.

Lapageria (*Liliaceæ*) or Chilean Bell flower.—A climber for the shady end of the greenhouse. Leaves dark green and leathery. Flowers waxy, rich rosy crimson—appear in July, continuing for some weeks—in long trails unless pinched back to produce clusters.

Pruning consists of cutting back shoots that have flowered, unless needed to extend the plant.

Propagate by layering—which may take a year before the plants are rooted and can be cut away—or by strong growths cut from the plant and placed in a warm, close frame. Seed germinates freely in a warm house. Slugs attack the young shoots.

Plants do better in a border, where they like a compost of coarse granite or grit (not limestone), sandy peat, and some nodules of charcoal, combined with perfect drainage ensured by stone chippings, broken sandstone and clinkers.

Latania (*Palmaceæ*), Bourbon Palm.—Handsome palms for the

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greenhouse when small. *Propagate* by dry seeds sown in sandy peat in early spring. Pot into good rich loam with some bone-meal.

Lemon-scented Verbena. (*See* ALOYSIA.)

Leptotes (Orchidaceæ).—Stove Orchids.—Red, white, or purple flowers. Increased by division, in spring. When planting, nearly fill the pot with drainage, then use fibrous peat and old moss. Summer temperature 50°–65°.

Leucadendron.—Evergreens with beautiful silky, silvery leaves. Pot in March with equal parts of sandy loam and peat—with the addition of a little charcoal.

Propagate by seeds sown in sandy peat, or by cuttings of firm shoots taken in summer.

Leucopogon (Epacridaceæ).—White flowers. Evergreen shrub. *Propagate* by cuttings of ends of shoots under a bellglass. Soil, fibry peat and silver sand.

Lilies, *Lilium* (Liliaceæ).—Lilies do well in pots. They should be planted in deep, wide pots not too crowded. Large bulbs need 5 in. of space between any one bulb and another. Soil—a compost of two parts good loam, one part sand and a handful of leaf-mould well mixed. Only partly fill the pot at first to about 4–5 in., place the bulbs on this and just cover them. Add more soil as the shoot grows, until the soil is 1 in. from the rim. Winter in the greenhouse.

Lissochilus (Orchidaceæ).—Pink, yellow, or purple flowers. Compost, fibrous loam, leaf-mould and silver sand in a shallow pan in warm, moist part of stove. Pot in February or March—water freely while growing, and apply liquid manure every ten days. November to March keep quite dry—*propagate* by pseudo-bulbs in March.

Livistona Borbonica. (*See* LATANIA for Culture.)

Lycoris (Amaryllidaceæ).—Greenhouse bulbs allied to Scarborough Lily. Increased by offsets and by seeds, and grow well in equal parts of loam, leaf-mould and sand. The pots must be well drained. Flowers of the various species vary from yellow to red, pink and lilac-blue.

Mandevilla (Apocynaceæ).—Climbing shrub from the Argentine, with large, fragrant white flowers. Plant to train up a trellis from February to March in compost of loam and peat, equal parts with a liberal supply of sand and charcoal. Prune back to base of shoots after flowering. Propagation by cuttings of well-ripened shoots during summer.

Manettia (Rubiaceæ).—A climbing, evergreen shrubby plant with showy scarlet or yellow flowers. *Propagate* by cuttings of young shoots taken in spring and struck in sand, in heat or by division of the fleshy roots.

Plant in a compost of loam, peat, broken charcoal and silver sand in equal proportions. They do better if slightly potbound, but need plenty of water.

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Maranta (Marantaceæ).—Stove herbaceous plants grown chiefly for their beauty of foliage. Compost, 2 parts loam, 1 part leaf-mould and sand. Water freely in summer. Increase by division when repotting and keep in temperature of 70° for a few weeks.

Masdevallia (Orchidaceæ).—Probably the easiest of the family to cultivate, many diversities in form and colour. Culture: compost equal parts sphagnum moss and peat, liberal supply of broken crocks, several large pieces of charcoal. Repot in January or February when new growth commences, and propagate by division when potting. Syringe daily during hot weather, shade from hot sun, and water freely in the growing season, but in winter lessen the supply, never allowing it to become quite dry.

Miltonia.—Richly-flowering orchid, of great decorative value both on the plant and as cut flowers. There are also some unusually beautiful *Miltonia* Hybrids.

Culture: Use a compost of 3 parts well-chopped fibre to 1 part sphagnum moss. Half fill the pots with broken crocks. Shade, a moist atmosphere, and equable temperature night and day of about 60° should be aimed at. Repot when growing period commences, and then water freely. *Propagate* by division when repotting.

Mimosa (Leguminosæ).—Sensitive plant from S. America. Leaves are sensitive to the merest touch.

Compost: 2 parts loam, 1 part peat and sand. Pot early. Water freely during summer, at other times moderately. Winter temperature 50°; summer 70°. *Propagate* by cuttings of young shoots in sandy soil or preferably by seeds sown in light sandy soil in spring.

Naegelia (Gesneriaceæ).—Tuberous-rooted perennials with soft green or crimson heart-shaped leaves. They can be propagated by division of the rhizomes at potting time, by cuttings of young shoots rooted in sandy peat, by leaves pegged on to the surface of pots of sandy peat, and by seeds. Shoots and leaves must be kept at a temperature of 75°.

Culture: The tubers should be started in leaf-mould and sand with a little bottom heat; potted up in a compost of 2 parts loam, 1 part each of leaf-mould, dried cow-manure and sand, at intervals from February to June, they will provide a succession of flower from early summer till the following spring. Ample water must be given during flowering time and liquid manure once or twice a week after the buds appear.

Dry off plants that have flowered and store pots under staging until repotting time. Winter temperature 50°; summer 65°–75°.

Nepenthes (Nepenthaceæ). Pitcher Plant.—An insect eater. Its leaves end in hollow, cup-like vessels of various mottled colours provided with a cap and containing liquid; it is a perennial evergreen and propagated by offsets found near the base. These are placed in pots of sandy peat,

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in a propagator temperature 75°–80°. Seed can also be raised in the same way.

Planted in a suspended basket, the pitchers show to advantage. The soil should consist of sphagnum moss, peat and loam in equal parts with small broken charcoal and sand added, and January or February is the best time for planting. Water liberally, and syringe daily during the summer, but keep the temperature up to 80°.

Nerine (Amaryllidaceæ).—A lovely S. African bulbous plant, commonly called "The Guernsey Lily," which has a truss of ten to twenty bright rose flowers on a foot high stalk. There are several related varieties, mainly in shades of red and pink.

The plant thrives in a compost of 3 parts loam and equal parts of leaf-mould and sand, and requires autumn potting. Only repot at 4 or 5 year intervals as they prefer to be left alone. Give a little liquid manure to plants in bloom, and cease daily watering when the leaves turn yellow. *Propagate* by offsets when repotting.

Nerium (Apocynaceæ).—Oleander—a fragrant flowered evergreen—but poisonous. Its leaves are narrow and willow-like, and its flowers white, pink or red, and often double. They can be propagated by cuttings of young shoots inserted in a compost of peat, loam, leaf-mould and sand under a bellglass.

For potting out in tubs, use a mixture of 2 parts loam, 1 part leaf mould, and $\frac{1}{2}$ part sand, and give regular syringings and fumigations, as the plants are very prone to attacks by aphides. When flowering is over, cut the previous year's growth well back to the base.

Odontoglossum (Orchidaceæ).—Fine species of orchids. They have been bred into the beautiful race of *Odontoglossum* Hybrids, the orchids that hold the highest place in modern favour. They require a moist atmosphere always, and must be shaded from the sun when hot. The roots must never become dry, so summer watering must be ample, and winter moderate. Three parts of well-chopped fibre with 1 part of sphagnum moss in a pot two-thirds filled with broken crocks, will meet its needs as long as the pseudo-bulbs are resting above, not in, the compost.

Orchids.—There are a number of orchids quite as simple to grow as other greenhouse flowers, needing no great heat, and being of no great cost.

In most cases the main necessity for terrestrial orchids is the addition of sphagnum moss to the compost to secure moisture without acidity, and the general compost for epiphytals consists of fibrous loam, osmunda fibre, sphagnum moss and dried leaves.

Hanging baskets, for the growth of epiphytal orchids are preferably made of teak. The moist, warm atmosphere rots soft wood rapidly.

A warm, damp atmosphere is the prime essential, and great care

must be given to ventilation, spraying of the staging, and steady temperature.

Any nurseryman will advise as to the variety of orchid suitable to a cold greenhouse, but one of the best is *Cypripedium insigne*, the Slipper Orchid from Nepal. Others that have already been dealt with individually are *Odontoglossum*, the *Masdevallias*, and *Miltonia*.

Pancratium (Amaryllidaceæ).—A bulbous plant with a fragrant white flower. It is propagated by offsets when repotting. This is done in spring, in a compost of 3 parts loam—equal parts cow-manure, leaf-mould and sand. Potbound plants flower better, so it is wiser to leave them 3 or 4 years untouched. Water freely during summer, then gradually allow plants to become quite dry. Weak liquid manure in growing period is useful.

Passiflora (Passifloraceæ).—Passion-flower—native of Brazil—fragrant flowered, evergreen climber needing a cool greenhouse, in exposed positions, but growing in ordinary gardens when sheltered, and in the usual garden soil.

Seeds may be sown—or cuttings taken.

Pelargonium (Geraniaceæ) popularly called Geranium.—Herbaceous, evergreen, shrubby, perennial and tuberous rooted. They are used constantly for bedding out, for which their showy blooms are most suitable, and can be grown either as summer or as winter flowering plants. Amateurs look upon them as a yearly purchase—but it is not difficult to keep and increase a stock from year to year.

Summer flowering plants yield suitable side shoots for cuttings in July or August, and these are inserted singly in a 2-in. pot of sandy soil, or 5 or 6 in a 5-in. one. When cutting them, take off just below a joint and remove the lower leaves.

Kept moist overhead they will quickly root in the cold greenhouse or cold frame, but will need shading, and they will keep all the winter in greenhouse, or in a sunny window if frost is kept from them and very little water given. In spring the new growth requires more water and larger pots, and the soil should be changed to a compost of 2 parts good loam, 1 part coarse sand and 1 part leaf-mould or well-decayed manure, to which has been added 1 oz. superphosphate or 2 oz. bone-meal to each bushel of soil. They will make good bedding plants for early June. They are better kept in a dry atmosphere once they have rooted, as otherwise damping off starts and spreads to the whole set of cuttings. Bedding plants can also be taken up at the end of the summer, root trimmed, to fit as small a pot as possible, watered only just enough to prevent shrivelling, and kept in a greenhouse whose minimum temperature is 40°.

Winter flowers, in quantity, are obtained in the greenhouse, from plants that have different treatment. Cuttings for these are taken in

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spring, rooted in sand in the warm greenhouse and not allowed to flower during summer, any buds appearing being at once pinched out. The atmosphere must be kept up to 60°, and the soil is as for summer Pelargoniums. The winter plants from the time flowers open require more nourishing and can be watered with liquid manure or nitrate of soda ($\frac{1}{4}$ oz. to the gallon of water) once a week, given when the soil is already moist. Sulphate of ammonia can be given instead of the nitrate; soot water may be added to the liquid manure to improve the colour of foliage and flowers. Nip the main shoots to obtain a strong bushy plant and give all the sunshine possible.

Ivy-leaved Pelargoniums often grown in hanging baskets, in tubs or in ornamental vases, need the same treatment. They are, however, somewhat straggly in growth, and require tying, training and occasional pruning, if kept for some time. Green Fly attacks them readily, and occasional syringing with a paraffin solution or fumigating is beneficial.

Some handsome varieties of Pelargoniums are:—

ACHIEVEMENT, salmon pink.

GENERAL FRENCH, soft scarlet.

MARS, crimson.

PAUL CRAMPEL, single scarlet.

FRAICHEUR, white.

Petunia (Solanaceæ).—These are summer bedding plants that are very decorative for growing in the greenhouse. For this purpose they are sown in January on light open soil, pricked out singly into small pots, and potted on into richer soil in 5-in. pots for flowering. Any ordinary good bedding soil will do with leaf-mould as drainage.

As the flower buds appear, apply weak liquid manure and pinch out tops of young shoots to make bushy plants.

Phalœnopsis (Orchidaceæ).—Require a warm greenhouse and are cultivated chiefly fixed to blocks of wood suspended from the roof. They are epiphytal, and some of their varieties are the “Mother Orchid” and “Indian Butterfly Plant.”

Phoenix Palms.—Room plants, and used in greenhouses for decoration. Date palms are of the genus.

Loam, old decayed manure and coarse sand are used for potting them, and to enrich the green of their leaves a lump of sulphate of iron can be kept on the surface.

They are potted in February and need occasional syringing during the cold weather. In heat, syringing daily is advisable.

Platyserium (Filices).—Stag’s Horn Fern, from New South Wales. Evergreen. Can be grown in shallow pan or on a block of wood with the roots covered with a compost of equal parts of sphagnum moss and fibrous peat, all held in position by strands of copper wire. Add extra

soil in the early spring, water well in summer and keep the temperature up to 45°.

Platyclinus (Orchidaceæ). Epiphytal Orchids for the warm greenhouse need a winter temperature of 50–60°, and in summer 80°. Propagated by division of the pseudo-bulbs as they appear. Flowers fragrant, and white or greenish-yellow.

Plumbago (Plumbaginææ). Leadwort, so called from the eye disease for which the plant was used, is a dainty blue flower and is deservedly popular both for its colouring and its graceful trailing growth, which decorates the pillars of the greenhouse, or makes a lovely pot plant trained over a trellis.

Plant it in February or March in a compost of 2 parts fibrous loam, 1 part silver sand mixed with leaf-mould; syringe it daily till the flowers appear, then give weak stimulants twice a week, and as soon as the flowers fade cut back to within 1 in. of the base. Propagate by side shoots taken any time from February to August or by seeds sown on sandy peat in early spring.

There are also pink and white varieties.

Poinsettia (Euphorbiaceæ).—Remarkable for the scarlet, white or pink bracts that surround its insignificant yellow flowers. A double variety is grown with smaller brighter bracts within the larger ones.

Propagation by cuttings inserted in sandy soil in a hotbed, temperature 75–80°, shaded and moist until rooted.

When potted into a compost of turfy loam, leaf-mould and old cow manure with some silver sand, their supply of light and air is gradually increased, and they come to maturity in a cool greenhouse (Temperature 50°).

When flowering is over, water is gradually withheld to allow of the necessary plant rest.

Polianthes or Tuberose (Amaryllidaceæ).—Fragrant white-flowered bulbs, which can be increased from offsets or grown from seed, but a bulb once having flowered is of no further use.

Put the bulbs, $\frac{2}{3}$ of their depth, in a compost of leaf-mould, loam, decayed manure and silver sand, and plunge the pots to their rims in bottom heat. Water once only before growth begins, afterwards remove to a shelf near the glass.

Bulbs may be grown also in a cold frame and removed to the greenhouse for flowering as with spring bulbs. When growing freely they will need a stimulant in the form of fertilizer.

Primulas. See CHAPTER VI.

Rhodochiton (Scrophulariaceæ).—Evergreen climber with clusters of nearly black flowers with large red calyces, in summer.

Raised from seed, or cuttings, it flourishes in sandy loam and peat,

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and requires copious watering and stimulants when flowering. In February cut back. In March sow seeds in ordinary soil. In summer take cuttings and insert in sandy soil under a bellglass.

Richardia, or Arum Lily (Aroideæ).—A herbaceous perennial, which must be repotted annually in August to September, watered moderately during the winter, and more freely in flowering time. At this time too they should have a little nitrate of soda, or sulphate of ammonia.

Flowering over they can stand outside, but must not be allowed to dry off, and as they are attacked frequently by Green Fly, they must be syringed whenever there are any signs of it.

Rivina or Blood-berry (Phytolaccaceæ).—Decorative mainly at fruiting time when its scarlet berries make it a beautiful table plant.

Pot in February or March in leaf mould and sandy loam. Keep in cold house shaded from sun in summer. Winter temperature 55–60°.

Propagate by cuttings taken, or by seed sown, both in sand, in spring-time.

Salvia (Labiata).—*Salvia Splendens*, is a beautiful plant with silver spotted leaves and brilliant scarlet flowers, and the blue flowered *S. patens* is nearly as lovely. The latter must be treated like a dahlia, the roots being lifted, dried and stored in autumn.

Culture: The seeds are sown in well-drained soil consisting of leaf-mould loam and sand. Press seeds into soil, cover with $\frac{1}{2}$ in. of sand, water in with tepid water and place in a propagating pit. Prick out when seedlings have made enough root. Pot into 60's when 2 or 3 in. high, using similar compost with a sprinkling of complete fertilizer, grow on, in good heat, and when potting into 32 size pots use a rather coarser type of similar compost, and somewhat richer. Old plants from outdoor beds are taken into the greenhouse in spring and young shoots grown to provide cuttings. These are rooted in sandy soil in a moist warm frame.

Schizostylis (Caffre Lily) (Iridaceæ).—Ideal pot plants with scarlet flowers resembling *Gladiolus*, but much smaller. They bloom in November and December when flowers are scarce.

Culture: Compost 2 parts loam, 1 part leaf-mould and sand. Repot annually in September, give liquid fertilizer occasionally and stand in cool greenhouse. After flowering they can be moved into a cold frame, but are better plunged up to the rim in ashes, and never allowed to dry out.

Scutellaria (Skullcap) (Labiata).—Helmet-shaped flowers, with blue and white colourings appearing in August. Plants propagated by seeds or cuttings. Pot in February or March in compost of 2 parts loam, 1 part leaf-mould, decayed manure and sand. Give stimulants in summer. When main shoots are 3 in. long nip off the points. Temperature 75–85°.

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Sobralia. Stove terrestrial orchids.—Compost, *see* Orchids. They do not require moist atmosphere. *Propagate* by division.

Solandra (Solanaceæ).—*S. Grandiflora* the Peach Trumpet flower is the best known. Flowers purple and cream. Stove climbers, planted in pots of soil composed of 2 parts sandy loam, 1 part peat, $\frac{1}{2}$ part sand and $\frac{1}{2}$ part cow manure. Pot in February, water well. Prune moderately. Train to trellis. *Propagate* by cuttings in spring.

Solanum capsicastrum (Solanaceæ).—Sown in January grown in cool greenhouses in summer. Berries in winter. Seedlings need gentle heat and a loam, leaf-mould and sand compost. In later repottings add a little well decayed manure. Cuttings may also be taken. A larger display of berries may be secured by brushing the flowers over with a rabbit's tail to ensure pollination.

Sophro-cattleya, Sophro Lælia, and Sophronitis are all species of orchid and cultivated in the manner given under orchid.

Spiræa (Rosaceæ).—*Spiræa Japonica* is the best greenhouse species. Its flowers are white or red in fine spikes, and it makes a bushy plant about 2 ft. high. There are several new hybrids of this variety now on the market.

Culture: Pot in autumn. Soil, 2 parts loam, equal parts leaf-mould and silver sand, a little charcoal. Stand in cold frame till January. Force in temperature 55°, but if for ordinary greenhouse flowering temperature 40–45° is better. When growth commences water freely and give liquid manure in small doses. After flowering put outside in a sunny moist position for two years before repotting as they do not flower every year. To buy new plants annually from a nurseryman will give the finest results. *Propagate* by division of roots.

Stephanotis (Asclepiadaceæ).—Clustered wax flower. A fragrant white-flowered climbing evergreen for the warm greenhouse.

Culture: Compost 1 part each of peat and silver sand, 2 parts turfy loam. Plant out in the bed and train up wires to the roof, or plant in a tub in February. Shade from strong sun. Give ample water in flowering time and liquid manure once a week from May to September. Prune away weak growths, and cut strong ones well back to their base early in Spring. *Propagate* by cuttings of well grown shoots in spring; insert these cuttings in sandy peat and put them in a propagator. Temperature 70°.

Streptocarpus (Gesneriaceæ).—Charming and popular greenhouse perennials in many beautiful colours. 12 in. high with rather large crinkled leaves, the bell-shaped or tubular flowers are 2 or 3 on a stem and often showily striped.

Culture: They are treated as biennials. Early spring seed produces August flowers which carry on through the winter. The second season

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flowers are larger and more numerous, making a strikingly handsome plant. The seeds sown in gentle heat are pricked out into fresh boxes of soil when large enough. Then into 60° and finally into 48° with a rich open compost of peat, well-rotted manure, fibrous-loam and sand.

Mealy bug and Begonia mite will attack these plants, and they must be fumigated.

Streptosolen (Solanaceæ) has large heads of orange-scarlet summer flowers. For the spring potting use a compost of sandy-loam, peat and leaf-mould. Needs ample water during flowering time and should be shaded from direct sun.

Propagation: Spring cuttings, or seed, in sand under a bell-glass in gentle heat.

Strobilanthes (Acanthaceæ). Cone-head.—Species range in colours from lilac to violet-blue, one variety having beautifully variegated leaves. Fibrous-loam and sandy peat with a spot close to the glass in the sunny greenhouse will bring on the flowers. Frequent syringing and plenty of water are required during summer.

Propagation: Cuttings inserted in sandy soil under a hand-light in close atmosphere.

Swainsonia (Leguminosæ). The Darling River Pea.—A climber with graceful fern-like leaves and sprays of flowers like red peas.

They are raised from cuttings, in heat, in spring, and cultivated in silver-sand, loam and peat.

Propagation: Soak seeds and sow in a hot-bed in April; or summer cuttings may be kept in sandy soil in a pit, to root.

Tacsonia (Passifloræ).—The large bright starry flowers, like colourful Passion flowers, that droop from the rafters of the greenhouse, make this climber well worth cultivating. They are potted in February or March in pots of fibrous-loam or peat, dried cow-manure and some silver-sand, or they can be grown in well-drained tubs. Prune in winter. Thin out new shoots as needed during growing period. *Propagate* by cuttings in propagator, in spring. Temperature 65–70°.

Tecoma (Bignoniaceæ). Trumpet Jasmine—has showy orange or yellow tubular flowers and can be cut back to produce bushy pot plants, or trained as a climber.

Culture: Compost loam, peat and silver-sand. *Propagate* by cuttings. Prune in February, by cutting back to within a few buds of the old wood, or by layering shoots in sandy soil in summer in the greenhouse, or by root cuttings in a propagator in spring. Heat 60°.

Tradescantia (Commelinaceæ) Spiderwort.—The greenhouse species *T. zebrina* is grown mainly for the beauty of the leaves on its long trailing stems. These are greenish-white above and purple below, or in one variety striped with yellowish-white and suffused with carmine

rose. They are used in greenhouse rockeries or hanging baskets, and propagated by spring cuttings inserted in sandy soil and grown in gentle heat.

Vallota (Amaryllideæ) Scarborough Lily.—A South African plant. *Culture*: Compost loam, leaf-mould, sand. Top-dress every year with the same compost. Plants thrive when pot-bound, so do not repot till needed. Water copiously in hot weather, freely when growing but little in winter. Winter temperature 40°. Pot new bulbs in spring. *Propagation* by off-sets.

Zebrina. See TRADESCANTIA.

GARDENING IN WINDOW-BOXES

Where it is impossible for the garden lover to cultivate a garden, a window-box, properly made and filled, may be regarded as the "next best thing." A soundly-constructed box is more attractive than a row of ordinary flower-pots stood on the window-sill. It is also cleaner and easier to manage, and will accommodate far more plants than could be grown in pots. Where the purse will allow, ornamental tile boxes can be used, but a well-made wooden box is just as attractive, if properly planted, and will last for many years. Metal boxes are undesirable; they conduct heat too rapidly, and the plant roots suffer. In metal containers, the best practice would be to use pots, packing round them, inside the metal box, some coco-nut fibre or similar material.

How to Make a Box.—The box, in length, must properly fit the sill for which it is intended, and may be made as wide as is consistent with safety, but the depth can vary, six inches being the minimum.

For a strong, durable box, 1 in. or $\frac{3}{4}$ in. timber should be used. To make it more attractive, and also to preserve the box, paint or stain the outside, preferably some inconspicuous colour that will tone with the house front.

The best way to treat the inside of the box is by charring. Failing a blow-lamp, which is the best tool for this, brush over the inside of the box lightly with a little paraffin, and light a newspaper inside. When the sides are just charred, quell the fire with a wet rag, or turn the box upside down to put the flames out. This must be done in a garden, or where there is no possibility of setting light to surroundings.

Secure the Box.—The next thing is to set the box in position and make it safe. Most sills slope slightly outwards and downwards. To make the box stand level, therefore, it should rest on two pieces of wood, wider at one end than the other. These are best nailed to the bottom of the box before it is taken to the window-sill.

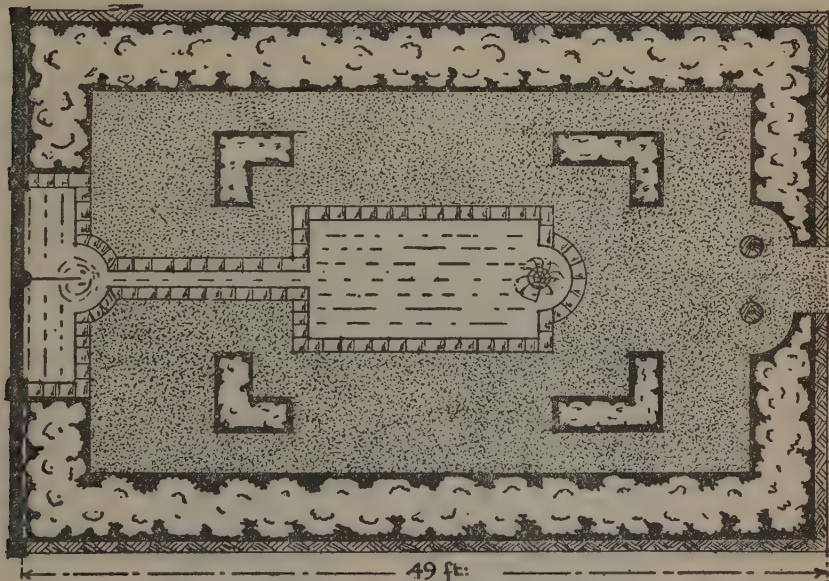
If as an added safeguard some brackets are nailed to the ends of

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the box and secured by screws to the sill or the window-frame, there will be no danger that the box will fall.

Should there be any possibility of water draining from the box, dripping freely, and becoming a nuisance, a metal tray below the box, can be arranged to catch the surplus water.

Drainage is Vital.—Drainage holes are essential, and the best way to make these is to burn through the wood with a red-hot poker.



Simplicity is the keynote of this design. It is a layout suitable for a rose garden, or a small town garden

Preparation of the soil is important. Decayed leaves and farmyard manure, mixed with ordinary garden soil, will make a good compost. Coarse sand may be added, and dry lime or old mortar rubble is also helpful, as these will keep the soil open and porous. A double handful of bone-meal is also good.

Before filling the box, drainage should be amply supplied. For this purpose a layer of stones, broken pots, broken cinders or coke, or oyster shells from an obliging fishmonger, should be put into the box. Over this, an inch layer of decayed leaves, manure, or turf, to hold moisture, should be laid. Next comes the prepared soil, the coarser part first, and the top layer is sifted through a $\frac{1}{2}$ in. mesh sieve. It should come to an inch from the top of the box when lightly pressed flat and level.

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In addition to the manure in the under-layer, liquid fertilizers are used during the growing season, to assist the plants. This is needed, because the plants will naturally be rather crowded and the soil not very deep, so that they may soon be short of food. When applying liquid fertilizer, the soil should be already wet. If there has been no rain, a good soaking with clear water should be given an hour or so before the fertilizer is applied. Any commercial preparation, such as those supplied in, or with, handy sprinklers, can be used if the plants



A small paved garden, sheltered from winds by a wall extended from the house, makes an ideal out-door room for early spring days

seem slow in growing, but only after they have been in the box a few weeks.

Suitable Plants for the Window-box.—A single window-box can be very interesting if suitable plants are chosen for cultivation. Points to remember are the height and habit of the plants to be grown, and, of course, their colour. Bulbs in spring are excellent because of their uniform growth, and climbing plants such as Canary Creeper, or Virginian Creeper can be trained very effectively round the windows.

Auriculas and Wallflowers with the spring bulbs, Geraniums and Alyssum for summer, and dwarf shrubs such as Golden Aucubas for winter, will keep the window-box colourful and interesting all the year round.

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Some plants will need staking to prevent damage by winds, but it is better to keep mainly to dwarf plants, and to creepers that trail over the front of the box. The practice of training climbers up the sides of the window has, I think, little to commend it. They do not as a rule improve the appearance from inside, and would be more graceful, seen from the house front, if allowed to hang down.

When planting summer-flowering plants, see that the plants are well hardened. This can be judged by the deep colour of the foliage, and the short-jointed, sturdy stems.

A good ball of soil should be lifted with each plant, and this should be put carefully into the box, pressing the soil quite firm round it.

Water must be given regularly. It is best to give a good soaking two or three times a week, but where this is undesirable, a little each evening will keep the soil moist. Dryness is one of the commonest causes of failure.

Some suitable plants for cultivation in window-boxes are:

Antirrhinums (sun).	Lobelia (sun).
Aubrietia (sun).	Marguerites (sun).
Aucuba (Dwarf Evergreen) (winter).	*Morning Glory (sun).
Auriculas (shade).	Nasturtiums (sun).
Begonias (shade).	Night-scented Stock (shade).
Calceolarias (shade).	Olearia (winter).
*Campanula isophylla (sun).	Petunias (sun).
*Canary Creeper (sun).	Primula (Juliaë) (winter and early spring).
Chrysanthemums (sun).	Salvias (sun).
*Cobæa scandens (sun).	Saxifrage (Mossy) (sun).
*Creeping Jenny (shade).	Sweet Alyssum (sun).
Crocus (early spring).	Ten-week Stocks (sun).
Daffodils (spring).	Tobacco Plants (shade).
Forget-me-nots (late spring).	Tulips (spring).
Fuchsias (shade).	Violas (shade).
Geraniums (sun).	Virginia Stock (sun).
Hyacinths (spring).	Wallflowers (spring).
*Japanese Hops (shade).	Zinnias (sun).

* Suitable for trailing over the sides of the box. (All to be grown in the box during summer and until the flowers cease, unless otherwise stated.)

Special Difficulties.—One of the common troubles with window-boxes is that keen draughts blow along a street, and cut down the plants. The quarter circle of vicious-looking spikes, invented to keep away

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marauders, and still seen on many ground floor bay-windows of Victorian houses, has a new use in this connection, for it breaks the winds and makes a real protection for window plants. Where no such protection exists, something on the same lines might be made of wood, and covered with a hardy climber whose roots are in the box.

ROOF GARDENING

A roof-garden cannot, of course, be adopted by every house-owner, but where the roof is flat, and access to it is possible, a roof-garden forms a very charming feature often with the special attraction of complete privacy. It makes an ideal place for sun-bathing.

The plan should be as simple as possible, and one seat at least should be provided, as, of course, the joy of the roof-garden is in its provision of a quiet resting-place.

In a very small space, rock-gardens have a special appeal, and if the roof constitutes the only garden, a rock-garden is the best kind to be made there. Almost numberless plants can then be grown, which will add greatly to its interest. If a roof-garden is made on a modern house, in a rural district, it will probably be on quite a different line, i.e. it will be boldly but simply decorative, perhaps being limited to a few clipped trees or pyramid conifers, and one or two bright bowls of seasonal flowers.

Before setting about the construction of the garden, the makers must make certain what weight the roof can take, and the garden must be planned accordingly. Any heavy weights must be kept to the parts of the roof where there is most support.

The essential thing for success in a roof-garden is to secure good soil. Virgin soil is best, and to this should be added decayed manure at the rate of one-part manure to ten-parts of soil.

This soil must be used to a depth of at least 6 in., and should lie over inverted turves, so that it does not either become stagnant, or get washed away down the roof-gutters. The methods of supporting this soil vary greatly. In a little roof-garden, it is probably best to use deep boxes or tubs only. The boxes can be specially made to fit, using 1-in. thick wood, or they can be merely deep boxes of any convenient shape or size, stood wherever desirable on the roof.

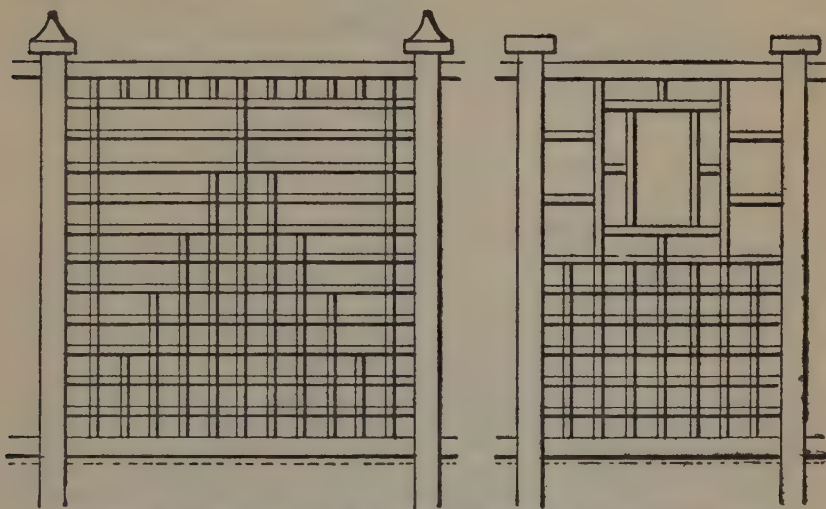
In a larger scheme, concrete or brick walls, 10-15 in. high, can be built to enclose the soil beds. Holes must be left here and there to allow surplus water to drain away, and some protection should be given over the house-gutters to avoid trouble from soil washing into them. (This, by the way, is of great importance while the garden is under construction, and loose heaps of soil or turf lie on the roof.)

On enclosed beds of soil, grass lawns can be made, if the roof is

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sufficiently large. Or bold bedding schemes can be planned, as in the larger garden.

For climbers or shrubs, however, deeper containers such as tubs are necessary, and these can occupy key positions in the roof-garden plan. A large roof rock-garden would be built on the lines laid down elsewhere, but with the base of the rockery built on a cement or brick enclosure similar to the ones used for formal bedding. Even a shallow pool or rill could, in some cases, be included in the same manner by the ingenious gardener.



*Originality in trellis work can be obtained by working out your own designs.
Oak or teak are the most durable timbers to use*

In any case drainage is an essential factor to the success of roof gardening.

This is best secured by inverting turves at the bottom of the box or flower border. In the walls of the border, tear holes must be left at intervals of 6 ft. to permit the escape of water, and simple seepage drains of broken bricks about 2 in. in depth can be led to these across the border underneath the soil. The drainage material should be placed in position before the turves are laid over the surface of the roof. It cannot be too much emphasized that the secret of success in a roof-garden is to provide sufficient depth of rich, turfy soil, 6 in. being considered a minimum quantity.

On the roof-garden, protection must be given from strong winds, according to the position of the house. Trellis work forms an effective screen, and quick-growing climbers such as Climbing Knotweed, Wistaria,

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and Roses of the Wichuraiana type, can cover it, their roots being happy enough in a tub or deep box, if the soil is rich and well drained.

Some suitable plants for cultivation in the Roof-Garden are:

Alyssum saxatile.	Armeria.
Antirrhinum.	
Arabis.	
Aubrietia.	Campanulas.
Cheiranthus.	Chrysanthemums.
Cerastium.	Corydalis.
Dianthus (all kinds).	Dahlias.
Eschscholtzia.	
Heuchera.	Geum.
Helianthus.	Gladioli.
Iberis.	Iris.
Linum.	
Nepeta mussini.	Papaver.
Pelargonium zonale.	Pentstemon.
	Salvias.
Sedums.	Sempervivums.
Statice.	Bulbs of all kinds.

GARDENING IN TUBS

Tubs can be a very ornamental and dignified addition to a garden scheme if the right plants are chosen.

Ornamental garden tubs can be purchased, but these are expensive. A rain tub, cut in half makes two very serviceable tubs at a reasonable cost.

When the tub has been cut, burn half a dozen or more holes, an inch in diameter, in the bottom, in the same way as is done for window-boxes. This allows free drainage.

As the box is filled each drainage-hole should be covered with crocks, concave side down. This keeps the holes clear of soil. Decayed leaves or coco-nut fibre come next, followed by mortar rubble, mixed with the roughest of the soil, with a covering of fine soil on top. The soil should be fairly rich, with plenty of bone-meal added.

Plants recommended for window-box culture are also suitable for growing in tubs. In addition, *Agapanthus*, the Blue African Lily, is an excellent plant for tub culture.

Dahlias too, may be grown to advantage, and so also can formal topiary specimens, or Pyramid Conifers, Standard Brooms, Lilacs and Fuchsias.

Bulbs can be planted in association with shrubs, and most attractive

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schemes are possible with such spring beauties as deep blue and golden-yellow Crocus, blue and white Chionodoxas, scarlet Tulip, and dark-green or gold evergreens.

Lilies, Funkias, Ferns, Ivy, Solomon's Seal and Virginia Creeper are other plants for growing in tubs, specially suitable where the situation is comparatively sunless, as in a small paved town garden, or on a balcony or terrace facing north or west.

Watering.—One point should be noted specially concerning tub-culture. Watering must be regular, and thorough. If a tub once dries out, the soil cracks away from the sides, leaving a cavity. Water given after this usually drains rapidly away without soaking the hard ball of soil, and fatalities occur. Keep the soil moist by daily watering, rather than try to soak the soil at rare intervals.

THE YEAR UNDER GLASS

January

The greenhouse must be kept clean and well aired. This month is appropriate for cleaning and repainting the greenhouse where Chrysanthemums have been flowered.

The interior of the house should be well scrubbed with disinfectant soap. White paint adds to the light of the interior.

Necessary repairs should be undertaken, at the same time make good all stages, and renew hooks, supports, etc., for climbing plants.

When airing the greenhouse at this time of year, see that the ventilators on the side away from the wind only are opened. Cold frames sheltering Violas, Antirrhinums and other hardy subjects may be left open during the day, closing them only when frost is severe.

For early flowering, the following seeds can be sown this month in a heated greenhouse:

Antirrhinums	Amaryllis	Annual Carnations
Begonias	Cyclamen	Grevillea
Gloxinias	Petunias	Schizanthus
Verbena		

Early vegetables can also be sown now, including: Cauliflowers, Carrots, Lettuces, Leeks, Mustard and Cress and Onions.

Tomatoes can be sown in sterilized soil, and good soil prepared for use later in pots or the greenhouse border. All soil for tomatoes should be sterilized before use.

Seeds should be sown in boxes or seed pans supplied with good drainage and filled with specially prepared compost.

A good sowing compost consists of two parts good loam and one part

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leaf-mould, with the addition of sharp sand. Vary the amount of sand, according to the kind of seed; for delicate seeds that damp off easily, add more sand, and reduce the amount of leaf-mould.

Take cuttings of greenhouse Chrysanthemums as they become available. Cuttings are made of young shoots about 3 or 4 in. long. Insert them in sandy soil, in a propagator, or in pots with a bell glass over them. This will be removed when the cuttings have well rooted.

Buy Lily bulbs now. Pack them in moist coco-nut fibre in the greenhouse. They will lose the shrivelled appearance which is common to lilies on sale at this season, and will be fit for planting in the open garden when the weather breaks.

Lilies to buy this month include *Lilium auratum* (gold-white), *L. Batemanniae* (red apricot), *L. cordifolium* (yellow-gold), *L. hansonii* (orange-brown), *L. henryi* (orange-red), *L. leichtlini* (yellow) and *L. tigrinum* (orange-red), the popular Tiger Lily.

When watering plants in the greenhouse, use water of the same temperature as the greenhouse. Tap water is usually too cold. A rain-butt inside the house, connected to the gutters outside, is a useful source of supply.

Generally speaking, as little water as possible should be given to plants in winter.

February

The chief work to be done this month is in the care of young seedlings, and planting them out into boxes, which can stand over the hotbeds, or in the cold frame.

Early Lettuce and Onions can be thinned out in the frame. They must not be "nursed," or the crops will be poor.

Hotbeds can be made up this month. Daily attention must be given, to keep up the heat, fresh manure being added to the sides of the frame as the temperature falls.

The hotbed can be used for early supplies of Globe Artichokes, Tomatoes and Vegetable Marrow, all of which can be sown or started into growth this month.

Salad crops can also be raised in a hotbed.

Dahlias can be started in heat. Place the dahlias in shallow boxes of moist soil and do not allow them to dry out.

Begonias can be started by treating the tubers in the same way, or they can be started in moist coco-nut fibre.

Repot Fuchsias, and after repotting give them a little bottom heat.

Geraniums, too, can be given bottom heat this month, to induce new growth and cuttings taken from the plants that have been flowering all winter.

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Other plants ready for propagation by cuttings this month are: Coleus, Heliotrope, Perpetual-flowering Carnations, Petunias.

Greenhouse plants are very subject to mildew at this time of year. An effective spray of 1 oz. of Liver of Sulphur in a gallon of tepid water is useful, but it must not touch white paint.

In spare moments, prepare composts for the rush of seed-sowing next month.

Different seeds need varying proportions of sand and leaf-mould, the more delicate seeds need more sand, otherwise they damp off. Strong growers find more nourishment in a leafy compost and will not need to be transplanted so quickly if the seed boxes are well supplied in this respect. Two parts fibrous loam, one part leaf-mould, and one part sand, all rubbed through a $\frac{1}{2}$ -in. mesh sieve are a good mixture for most seeds. The coarse siftings should form the middle layer of seed boxes, i.e., between the crocks and the top compost. This improves drainage.

March

March is generally recognized as the seed-sowing month.

For a good show of Primulas in the winter, seeds should be sown now. Ordinary seed-sowing compost may be used, but care should be taken to add a good quantity of sand. Primulas are very apt to "damp off."

Cinerarias sown now will make a bright show on the winter and spring shelves of the greenhouse. They should be sown in gentle heat, in a compost of loam, leaf-mould, peat and sharp sand.

Sow half-hardy annuals for a show in the beds and borders in summer.

Some of the most popular half-hardy annuals to be sown this month include Asters, Petunias, Ten-week Stocks, Salpiglossis, Verbena, Nicotiana, Zinnias, Nemesias.

There is still time to start Begonias in the greenhouse, using moist soil or fibre for this purpose. Dahlias, too, can be started in the same way.

Both Dahlias and Begonias can also be raised from seed sown now.

Take more cuttings of early-flowering Chrysanthemums.

Winter Cherry (*Solanum capsicastrum*) can be propagated by cuttings.

Cannas should be well watered, to induce them to send out shoots, and potted up in good soil.

Peaches under glass should be thinned out now, one peach to every square foot of wall space being quite sufficient.

Ventilation is very important under glass this month, especially among vegetables growing under glass.

Hardy ferns can be raised now in the greenhouse by putting the spores (the brown dust on the back of the leaves) on to small sandstones in a damp, warm atmosphere.

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Now that frosts are not so frequent, and the weather is warmer, seedling plants such as Petunias and Cosmea, grown in the greenhouse for bedding out, can be potted singly in gritty soil and transferred to frames.

Pansies and Violas and similar hardy plants can be moved from the frames to the open borders to make room for the greenhouse seedlings.

Bulbs which have been grown for indoor decoration and have finished blooming can be planted in the borders, or in a part of the wall garden. They may flower another season, or miss a season and then send up flower spikes again.

April

Give more air and light to all seedlings. The more air the seedlings get, the sturdier plants they will make.

Cuttings that have rooted should also be given all the air and light possible.

Take boxes of young plants out of the frames and stand them in the open garden for a few days to harden. They should be returned to the frame at night if frosts threaten.

Pinch out just the tip from bedding plants which are wanted bushy and even for formal planting.

Seeds of Balsam, Celosia, Dahlias, Gloxinias, Lobelia, Petunia and Zinnias can be sown now, in the usual seed-sowing compost.

Sow Gourds, Marrows, Pumpkins and Ridge Cucumbers. These need a sandy soil with a liberal supply of leaf-mould.

They can be kept in the cold frame in a close atmosphere for a time, but soon as the seed germinates more air can be given. Always cover the frame at night.

All frames and house ventilators can be opened for a time during the day, except when winds are troublesome, extending the period as the month goes on, and brighter weather occurs.

Grape vines under glass can be pinched back now. Frequent syringing is desirable. The atmosphere should be kept warm and moist, and sudden changes avoided.

Any seedlings that become straggly and drawn should be pinched back now, to encourage side growth. Put them nearer the glass and give more ventilation to make the plants sturdier.

If necessary, Hydrangeas that have flowered can be repotted now. Cuttings can also be taken and inserted in a compost of loam, leaf-mould and sand.

For early strawberries, pot up some strong plants now. The plants should be well watered, and a temperature of 40-50° maintained.

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French Beans may be sown in pots early this month for an early crop. A fairly even temperature of 55° is necessary for their cultivation.

May

As each batch of seedlings and rooted cuttings is planted out, clean the empty places thoroughly, and repaint where necessary, in readiness for the next batch of plants.

Plants not yet trusted to the open garden should be hardened off gradually.

If seedlings appear to be damping off, dust immediately with Flowers of Sulphur, and give less water, specially avoiding overhead watering. See that sunshine does not scorch young seedlings; frame lights are often best removed entirely during the day, and replaced at night.

French Beans raised in pots may be planted out into cold frames, allowing about 18 in. between the rows.

Chrysanthemums and Perpetual Flowering Carnations can be potted up.

Repot Azaleas as required.

Layer Malmaison Carnations.

When Tomatoes grown under glass begin to set fruits, feed with weak doses of liquid manure, and top dress with tomato fertilizer.

Keep a dryish atmosphere round Tomatoes in flower.

Tomatoes can be sown now for winter supplies.

Shrubs in the greenhouse intended for summer bedding should be hardened off now.

It is safe to keep a temperature of 65° during the day and not less than 45° at night for houses where half-hardy plants and shrubs are being grown.

Regular attention must be given to watering and spraying in the greenhouse now that days are warmer.

June

Artificial heat can now be dispensed with in the cool greenhouse.

Azaleas and Camellias need a sturdy growing heat while they are making wood.

The half-hardy annuals, and other bedding plants, such as Dahlias and Geraniums, should be ready for beds and borders now.

Young Dahlia plants attract slugs, but as "Slugs prefer Lettuce" it is a good plan to put a few unwanted lettuce seedlings between the Dahlias as these are put out in their permanent quarters.

Tender shrubs in pots may stand in the open during fine days. This gives the gardener an opportunity to clean up under glass and wash down staging, etc.

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Fumigation and syringing must be done immediately if insect pests are seen in the greenhouse.

Chrysanthemums require to be repotted fairly frequently, using larger pots as soon as the roots fill the smaller sizes. The pots should still stand in the open, the stakes being secured to supports, so that winds do not blow the pots over.

Grapes should be thinned out this month. A pair of sharp-pointed scissors is best for the purpose.

Herbaceous Calceolarias and Primulas (*sikkimensis* and others) can be sown this month.

Primulas in particular require a sandy soil for seed boxes.

All seedlings should be pricked off as soon as the second pair of leaves show themselves.

Bright sunshine should be avoided, and an even temperature maintained.

While watering is essential, too much will encourage "damping off." The safest way to moisten seed pans is by immersion in tepid water.

Tomatoes should not be allowed to make side shoots; plants in flower should be tapped lightly about midday. This jerks the pollen dust on to the pistil, and encourages fruit setting.

July

Now that all the summer bedding-out plants have gone from the frames and greenhouses, opportunity should be taken to clean these and do repairs that are needed.

The frames should be repainted, and any broken glass replaced.

Greenhouses should be painted and repaired, including repairs to staging and flooring. Fresh shingle, shell, or other material should be introduced as a good base for pot plants.

Water should be given fairly freely to all greenhouse plants. Peaches and Nectarines, if attacked by red spider, should be drenched by syringing with clear water in the evening.

Annuals used solely for greenhouse decoration may be sown this month. These include tender annuals such as Schizanthus and Browallia, and also hardy annuals such as Clarkia and Nasturtiums, for winter flowering. Cyclamen seed may also be sown now.

Cinerarias and Primulas sown last month should be ready for potting into small pots. Stand the pots in the cold frame, and be careful not to let strong sunlight scorch the seedlings. Frame lights should be removed whenever possible.

Cuttings may be taken now of Hydrangeas and Pelargoniums.

Azaleas, Camellias and Citrus may be grafted.

When Azaleas in pots have finished flowering, the wood should be

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allowed to ripen. The pots may be plunged in ashes, in the open, or plunged in the soil of the border, up to the pot rim.

Freesias should be potted now in a compost of sandy loam and dry cow manure. Plunge the pots in ashes in the same way as Azaleas. Darkness is not essential, as the bulbs are covered with soil.

Frames not needed for the cultivation of such plants as Tomatoes and Cucumbers need not be idle. Cuttings of Pinks, Arabis, Aubrietia, and other early flowers can be inserted and shaded. Seedlings of winter-flowering annuals can be sown and brought on in the frame.

Whitewash over the glass of the frames prevents the scorching of seedlings and cuttings.

An alternative method is to cover the glass with sheets of paper.

August

The dull days of winter will need to be brightened by house flowers. Bulbs should be bought now, and the first batches potted up in soil or fibre. Paper White Narcissus and Roman Hyacinths are undoubtedly the easiest bulbs to flower at Christmas, where only a frame or cold greenhouse is available.

Bedding plants, such as Antirrhinums, can be raised from seed sown now in boxes, and pricked out into a nursery bed or cold frame to stand the winter.

Calceolarias may be sown now in a compost of loam, leaf-mould, sand and dry cow manure. They like a cool and fairly moist atmosphere. Watering should be done carefully, to avoid washing the fine seeds out of the pans.

For a late crop of French Beans, sow now in a spare frame. Use the usual sowing compost, with a foundation of well-decayed manure.

Cauliflowers can be sown in the frame now, but they should not be "coddled" unduly.

Achimenes that have finished flowering should be stood outside in order that the tubers may ripen.

Pelargoniums should also be stood in the open to ripen the wood.

Gradually discontinue watering Lilies, as they die down.

Disbud Chrysanthemums.

Cut back climbing plants if they threaten to outgrow their positions.

Repot Azaleas as needed.

Syringe frequently all plants attacked by Red Spider.

September

As cooler nights occur, bring greenhouse plants that have been in the open garden during the summer back into the greenhouse.

Plants need less water in winter (i.e. when they are resting) than

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in summer, and the amount of water given should be reduced accordingly.

Begonias should be allowed to die down now, but they can be left in their pots.

Achimenes and Gloxinias should be removed from their pots when the foliage has died down.

Parts of the greenhouse glass that have been whitewashed to keep out strong sunlight can now be cleaned.

As much air as possible should be allowed on warm days, but the houses must be closed at night to keep out frost.

Cuttings of herbaceous plants can be taken now and inserted in the cold frame.

Cuttings can also be taken of many kinds of trees and shrubs, these also being inserted in the cold frame. Conifers root readily in the frame at this season. Such cuttings should remain undisturbed until the spring.

French Beans can be sown, if a late crop is required, and heat available. They will be very welcome during the winter months.

Lettuce may be sown now for planting out in spring. Cos varieties are best to plant at this time of year.

For a succession of bloom, bring bulbs into more light and warmth in fortnightly batches.

It is still not too late to pot up spring-flowering bulbs in soil or fibre. Tulips, Lilies (Easter) and Iris (Spanish, English and Dutch) are all very showy and decorative on the greenhouse shelves.

October

Constant attention should be given to the ventilation of the greenhouse and cold frame.

Frosts will put in an appearance fairly frequently now; always close the greenhouse ventilators at night.

The following should be potted up now: Lilies, Lily of the Valley, Pansy cuttings for winter flowering, all hardy and half-hardy annuals for greenhouse decoration, flowering shrubs intended for forcing, and perennial plants used for summer bedding.

Plants that have been in the open or in the frames during the summer should be brought into the greenhouse now. These include Chrysanthemums for late flowering, seedling Cinerarias, Freesias, and other slightly tender bulbs.

Young seedlings of greenhouse annuals should be encouraged into bushy growth. To ensure this the tips should be pinched out now.

Perpetual flowering Carnations and Chrysanthemums should be disbudded now.

Cuttings can be taken of shrubby Calceolarias, Pansies, Penstemons,

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and Violas. They should be inserted in a suitable compost in boxes, and stood in the cold frame.

Cauliflower plants can be lifted, with a good ball of soil, into the cold frame to protect them from frost until they are required for table. If the plants have to remain outdoors a few leaves should be tied over the heads. This also keeps them clean.

Tomatoes and Mustard and Cress may be sown this month.

Primula seedlings should be kept cool and near the glass.

Some of the potted bulbs will be showing green tips; these can be brought into more light and heat as they progress. When the pots are removed from ashes, wash the outside of the bowls or pots to cleanse them, and dress the soil surface with shell or coloured chips.

Pelargoniums should be watered sparingly, and the leaves must be kept dry.

Fuchsias and Heliotropes should stand under the greenhouse staging, where they can remain all the winter. Fuchsias can be turned on their sides so that the pots dry out entirely.

November

For an early crop of new vegetables the following should be noted:

Seakale and Rhubarb may be forced this month.

Tomato seedlings should be potted up.

Cauliflower seedlings can be planted in the frames.

Lettuce, Mustard and Cress and Radishes can be sown in heat.

French Beans can be sown now, these requiring a steady heat of not above 55°.

Nectarines and Peaches can be pruned now, and a top dressing will prove helpful.

For a succession of bloom, pot more bulbs this month. Some of those already potted can be brought into full light.

Lily of the Valley crowns potted up now will flower plentifully during the winter.

Arum Lilies should be grown in a temperature of 60° if good flowers are desired.

December

The greenhouse must be well ventilated, even in winter, but great care should be taken over this. The ventilators should be opened every morning about 9 o'clock, *on the side away from the wind*, closing them again after a few hours.

Water should be given very sparingly, in fact, watering should almost cease, except in special cases.

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The stages should be kept scrupulously clean, and all dead leaves, etc., should be burned. This will prevent mildew.

For early flowering under glass, Dahlias may be started in heat at the end of the month.

Chrysanthemums should be cut down to about 3 in. from the soil level when they have finished flowering, and unwanted growths cut away altogether. A top dressing of leaf-mould and loam should then be put over the soil. This will encourage fresh growths. Water frequently, but do not give them too much water at a time.

Tomatoes can be sown now for an early supply, as can Beans.

Lift one or two Rhubarb roots into the greenhouse, where they can be forced. The roots should have a good ball of soil round them, when lifted. Replant in boxes of good soil, and stand them under the greenhouse stages.

Strawberries can be brought into the greenhouse for forcing.

Cinerarias and Primulas should stand near the glass where they can get plenty of light. This will hasten the blooms, to brighten the dull days of winter.

Christmas flowering bulbs need plenty of warmth and plenty of water.

Lilies-of-the-Valley can still be potted for forcing. Pot into pots or boxes in a leafy soil. Cover the crowns with coco-nut fibre; if this is not available, cover the crowns by inverting pots over them, until the leaves are about 3 in. high, when the cover can be removed.

Prepare composts for seed sowing, to save time later, when the rush begins.

Prepare boxes, wash pots, write labels, and make out seed orders for the earliest sowings.

SECTION IV—GARDEN MAINTENANCE

CHAPTER XIV

LEVELLING—PREPARING THE GROUND—SOWING—TURFING— LAWN FERTILIZERS

THE LAWN—ITS MAKING AND UPKEEP

THE green lawns of England are, even more than the stately homes of England, typical of our little island, whose rainfall is so cheerfully intermittent and irregular that the first item of a News instalment from the B.B.C. is "The Weather Forecast."

It is that very alternation of sun and shower that gives the lawn its greenness, and it is the restful green colouring that makes it so superb a setting for the beauties innumerable of the flower garden.

But only the care of the gardener gives it the smooth even surface, the springy buoyancy and the trim neatness that are its hall-marks.

Make the Site Level First.—The essence of a good lawn is its smooth greenness. In these days of rapidly developing housing estates it will probably be necessary for the amateur gardener himself to level the rough grass plot that the builders have left.

Levelling entails hard work, or high cost, so if a lawn is already made, unless it is very uneven or sloping, the amateur gardener will be well advised to leave it as it is, merely improving the surface gradually by regular rolling and top dressing.

There are two methods of levelling. One is to level the lawn to make it like the top of a table (i.e. horizontal). This is reasonably easy if the site is more or less level to begin with, but becomes increasingly difficult where there are slopes in different directions.

The other way is to make the lawn surface similar to that of a tilted table.

Although there are many instruments on the market for use in levelling lawns, it is possible to do this work with only the following aids: A quantity of pegs, a spirit-level, a wooden straight-edge (i.e. a piece of wood, say 10 ft. long, 2 in. wide and 6 in. deep), a garden rake, and a heavy roller.

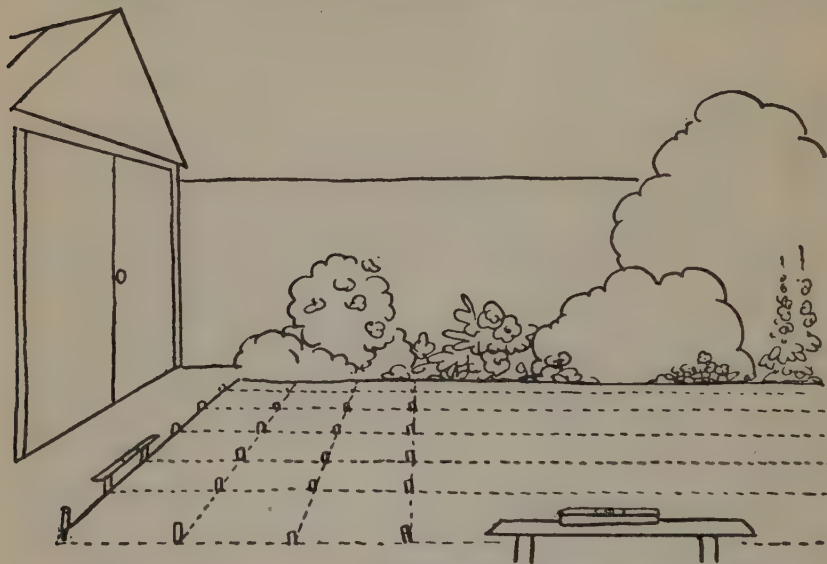
The first step is to remove the turf, and with it the top 6 in. of fertile soil, and move it out of the way.

Stack the turf carefully for subsequent use, and pile the fertile soil in a heap. Large stones should be kept out of the heap; they are not

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wanted in the top soil of a lawn. Stake out the area to be levelled, and notice the general slope.

It is a help if each peg is dipped in white paint to a depth of 4 in. from the top. Begin by hammering one into the ground, burying it up to the white paint at the highest corner of the plot. This will be the master peg, from which will be obtained the level for the others. Then hammer in the next peg, about 10 ft. further away, until its top is level with the



STRAIGHT EDGE AND SPIRIT LEVEL.

The site for a lawn should be raked level and tested with a straight-edge and spirit-level before sowing the seed

first peg. This can be ascertained by placing the straight-edge, with a spirit-level tied on it (for safety), on the two pegs, knocking the second peg farther and farther in the ground until the bubble in the spirit-level remains dead true in the middle.

In the same way hammer in and test a row of pegs, right across the lawn. By measuring the distance they stand out of the ground, the fall of the ground will be discovered. You have now to decide whether to make the lawn dead level or sloping.

Making a Level Slope.—If the slope of the ground, as shown by the pegs, is 10 in. in 100 ft., the slope between each of the pegs must now be made so that the soil level is 1 in. lower at one than at the other. At the next peg it should be 2 in. lower, and so on. These points can, if desired,

THE LAWN—ITS MAKING AND UPKEEP

be marked on the pegs, so that the work of adding or taking away soil is made simpler. Fill in all the hollows with soil cut away from higher parts, and keep the surface level with the help of the straight-edge, as well as with the eye.

Then replace the original top spit on the surface. If games are to be played a dead level is necessary. In this case remove the top spit, then peg out the ground and fill in the lower part of the lawn to the level of that by the master peg. Roll and rake this until it is quite flush with the marks on the pegs, i.e., showing only the whitened top. Check the work periodically with the spirit-level, and either remove or add soil as necessary.

If no other soil is obtainable it is necessary to remove the soil from the upper end to fill the lower. In this case it is best if the first peg is put in the middle of the slope. The pegs downhill are then driven in, after which, by wheeling the soil from one half to the other, the lower end is raised to the white painted marks on the pegs.

The top spit of earth should be replaced in 2 in. layers, and each one well rolled, to prevent it sinking later.

If Water Collects.—This presents a difficult problem to the amateur gardener, for it is not an easy matter to carry away the surplus water from a garden, and the difficulty is increased when the lawn is levelled from a hillside, in which case the bottom edge of the excavation must be well trenched. Whenever water collects on the surface of dug soil, more drainage is needed.

Surplus water is moisture which is held by the soil in larger quantities than is necessary for the requirements of plants, and which is unable to drain away. As soil gradually gets saturated, the air holes become filled, and so make the ground clogged, unhealthy and sour. To prevent this, trenches 15 in. deep and wide should be dug at about 15 ft. intervals and either filled with clinker, or provided with special pipes. The pipes (which are perforated) must be covered with a layer of clinker or broken brick. A solid clay soil packed close round the drains effectually keeps the water out of them.

There are one or two essential conditions to success in drain laying.

Always lay the pipes in herring-bone formation, the larger main in the direction in which the water is likely to flow, and the smaller drains diagonally across the lawn to meet it. Drain pipes for agricultural use are made in lengths of 1 ft. One of 3 or 4 in. in diameter used for the main drain, and others 2 in. in diameter for the branch drains, should be effective.

The best clearing-house for the drains is obviously a ditch or a land drain which is already in existence. Unless the gardener has these at his command he will have to fall back on his own resources. An ornamental

way out of the difficulty is to make a small lily pond about 10 ft. in diameter, and 2 or 3 ft. deep, and its cool beauty will be an addition to the attractions of the garden. Unless this in turn is provided with a sump for surplus water, it must be made with a "bog garden" edge. (See CHAPTER X on WATER FEATURES.) Failing this a 3 ft. sump (1 cubic yd.) can be dug and filled with clinker or other suitable material to within 1 ft. of the top. The drain will lead into it. The sump can be covered with a top spit of soil.

One other method of dealing with a damp lawn, although this is fairly expensive, can be recommended if only for the reason that the garden remains intact. This is known as the breeze method, and consists of repeatedly dressing the surface of the lawn during the winter months with breeze.

Soil Preparation.—There is no need to dig a lawn plot too deeply if it is already level. The top spit only need be turned over, if the drainage is not faulty. If it is, this must of course be attended to before the actual digging is done.

If a soil is inclined to be very sticky, in the new garden, pile all the rubbish you can on the site of the lawn, and burn it. Then pile more, and burn that. Then, when you have collected a goodly quantity of ash, add some sharp sand, and spread the whole of this material over the surface before you break up the top soil. This will help to lighten the soil, and make it more fertile. Soot is another material which can be generously used over the soil as it is prepared.

Bury all the roughest part of the soil as you dig. To do this, the easiest way is to take out a small trench first, carting the soil to the other end of the plot. Then as you turn over the next width of soil into the trench, and break it with a fork, you can also rake back into the trench any very large stones, so that they lie well below the top soil at the end of the job.

If the soil can be dug and limed, and left very rough for several months, it will work much more easily.

To make the surface as it should be for sowing, rake and roll alternately over the whole area. This, together with the removal of large stones, will create a surface 2 in. of fine soil, loose and friable, and ready for the seed.

The ideal soil for a lawn is good fibrous loam. If the soil at the gardener's disposal is found to be too light, add leaf-mould mixed with well-decayed manure. A dressing of lime at the rate of 4 oz. to the square yard is an advantage. If fresh soil has had to be introduced, it may contain the seeds of many weeds, and must either be left for some time before sowing to allow the weeds time to germinate, or burnt so that the weeds are destroyed. If manure is not to be obtained, a



Photo : Marshall and Snelgrove

1. A feeding lounge couch which makes possible play in the garden as possible
2. Swing hammocks in gay colourings make useful temporary garden furniture

1. *Chrysanthemums* give a fine display in the greenhouse in the early winter



2

2. *Tigridias* can be grown as greenhouse flowers



3. *Sutton's Mauve Queen Cyclamen* is only one shade of many in which these flowers can be obtained





1. Few greenhouse flowers can rival the Freesia for its delicious scent. The pink, yellow, and lavender varieties should be grown as well as the more common white



2. *Primula Dawkin's Carmine Pink* is a new variety, ideal for greenhouse decoration



3. Here is quite a small greenhouse heated by electricity



1. *Primula marginata* grows six inches high and has lavender-blue flowers in May

2. Golden single *Chrysanthemums* should be grown for greenhouse decoration in the early weeks of winter



3. *Luculia* is a fragrant shrub suitable for greenhouse cultivation. It has large pink flowers



Photo:
Liberty



Photo: Burton Holt

1. Garden vases should be ample inside otherwise there is not enough room for root growth.
2. A simple stone sundial is more in keeping with modern garden design than its ornate predecessors
3. A small stone figure can be used to add interest to a rock garden

2



1. Realistic stone animals are pleasing in the children's corner of the garden
2. A raised bird bath gives security from prowling cats

Photo: Scoffin and Willmott

3



3. A flat bird bath should not be placed too near well-grown bushes or borders

Photo: Burton Holt

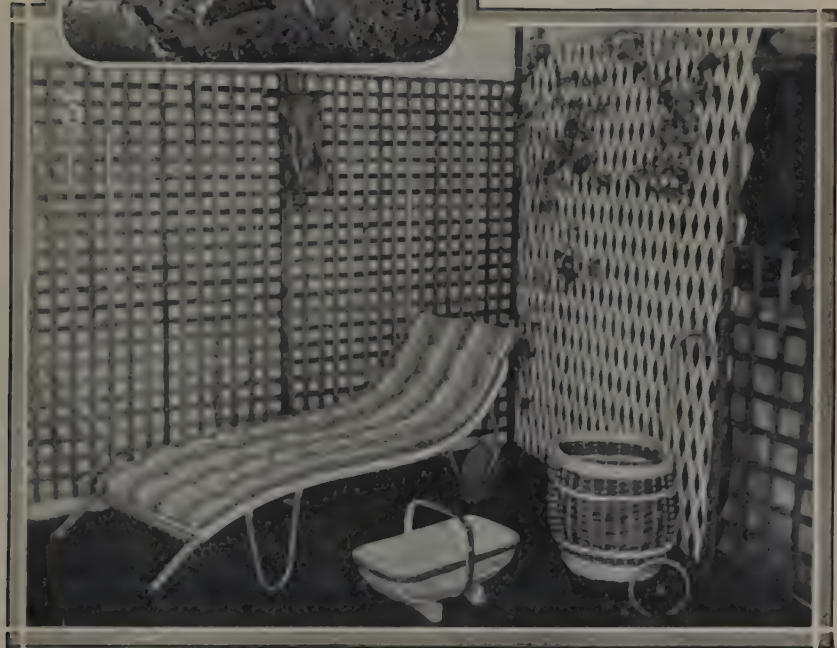
Photo: Revitt

1. A thatched bird table should be placed within sight of house windows, so that the antics of its guests can be enjoyed



Photo: T. & O. Associated Industries

2. Woven fencing makes a thorough protection against strong, cold winds



3. There are many ways in which wood can be employed in the garden



1. Photo:
Silviter Smith
2. Photo:
Boulton & Paul
3. Photo:
Revitt
4. Photo:
Pratten
5. Photo:
Armstrong
Addison
6. Photo:
Gaze

1. Formal conifers are in keeping with a stone summer-house and its tiled roof
2. A revolving summer-house with wide doorways can be turned to catch sun or shade as desired
3. Lim boarding makes a charming summer-house for the less formal parts of the garden
4. A small revolving house
5. A garden house fitted with vitra glass
6. A thatched summer-house is in keeping with the informal planting of this waterside garden



Photo: Carters



Photo: Suttons

1. A well-kept lawn is the best possible foil for summer flowers
2 and 3. A piece of lawn before and after treatment with a daisy preparation



Photo: Morgan

1. Quite a small garden can make room for a putting green
2. A paved edge to the flower borders makes for easy upkeep
3. The surrounds of a hard tennis-court should be planted as quickly as possible to bring the hard outlines into harmony with the main garden scheme



Photo: The Hortiphot Co.

1. A handful of lime scattered round a newly-planted fruit tree is beneficial
2. Fine saw should be worked over the roots of settling plants before the hole is finally filled in



1. Tall plants such as Hollyhocks should be staked before they show signs of needing the support
2. Paving should be tested with a spirit level to see that it is quite even. Care with the foundation means a lasting pathway

Photo: Croll

1. Drills for Potatoes are made with the back of the hoe



2



2. Celery should be blanched by tying paper round the shoots

3



3. Spring- and autumn-sown marigolds compared



Photo: The Hortiphot Co.

1. Turf is cut in strips one foot by three and rolled up until required
2. A special wooden beater is used to neatly put the new turf into place

1. A bundle of Lily of the Valley roots ready for forcing



2



2. Pot-bound Aspidistras can be divided and both parts repotted

3



3. Double Daisies are easily increased by division of the roots

1. Apple aphids can be controlled by spraying with tar wash in winter

2. A purplish fungus on the trunk in autumn indicates the presence of silver-leaf disease



3. Spraying with a hand pump and bucket will keep your shrubs and roses free from many summer pests

THE LAWN—ITS MAKING AND UPKEEP

good lawn fertilizer, 3-4 oz. to the square yard, can be applied and raked in with seed. It will hasten germination, and quicken and strengthen growth.

Buying the Seed.—It is always wise to let the dealer have a sample of the soil on which the seed will be sown, and information as to the purpose of the lawn, whether merely for pleasure or in part for games. He can then recommend the most suitable seed.

Grass seed mixtures are of two kinds: fine dwarf creeping grasses, and coarser grass that includes rye grass. The coarse mixtures are easiest to grow, and are recommended for lawns on heavy soils.

The finer and more expensive varieties are more difficult to grow and are slower in germination, but they do produce the best and finest turf, and are thus worth the extra care and attention they require.

Sowing.—Grass seed sown in the spring gives quicker results than at any other season. The best time for spring sowing is in early April.

Most gardeners prefer autumn sowing (late August or early September) as it makes a better turf, though it is slower in appearing. The warmth of summer has not yet departed, and with a reasonable quantity of rain likely to fall, the germinating seed is likely to settle down well into healthy growth before the cold of winter becomes severe. Spring-sown seed is often at the mercy of long dry periods of scorching sunshine. Another thing in favour of autumn sowing is that weeds are not so much in evidence, and by the spring, when they are more active, the grass seed is well established.

Method of Sowing.—Seed should always be sown by hand, preferably on a windless day. It can be more evenly distributed if mixed well with double its quantity of fine soil. It should be used at the rate of 2 oz. to the square yard, in order to get a close crop.

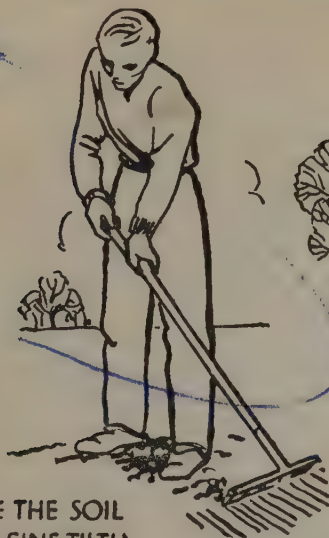
Seed sown at the rate of 1 oz. per square yard is good enough for large grass areas in rural districts, but better results are obtained from the use of 2 or more ozs. If the seed is sown thickly, the grass from the start will form a thick carpet, and will soon make a close, springy turf.

The best grass seed is cheaper than the cheapest turf, but it must be allowed time to grow. In autumn it takes from five to ten days to germinate and, on the average, a year is the minimum time for a lawn to reach maturity. Seed sown in late March or early April will germinate in a fortnight or three weeks, according to weather and, given warm spring rains, it will spring up rapidly, but in the drying winds of spring its early haste is soon slowed up.

To ensure even distribution, divide the lawn off into strips of equal size, and divide the seed too, to allow the correct share for each. It is often wiser to sow two ways, half the seed sown across the plot, and then the other sown in lengthwise strips. This makes more even distribution.

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Rake lightly both ways to cover the seed, and finish by rolling with a medium-weight roller. Do not attempt to cut the grass until it has reached a height of 2 in., then use a very sharp mowing machine set high so as to skim off just the tips. The weeds, which will probably be fairly abundant, especially in spring, should be pulled out by hand.



RAKE THE SOIL
TO A FINE TILTH



SOW, FIRST UP, THEN
ACROSS THE SITE.

Grass seed can be sown in October or March. This is the cheapest way of making a lawn. Two things are essential: to clean the soil well and to pull out weeds which always come up with the grass seedlings

Beware of Birds

Before the grass actually germinates, it can be protected from birds by stretching black cotton on sticks from side to side, by draping old curtains over pea sticks placed over the seeded surface. Dusting disinfectant powder over the seed before sowing will also discourage the birds.

A top dressing of guano (1 oz. to a yard) will help on the young grass, and a complete lawn fertilizer, either dry or in solution, will also work wonders.

Bare Patches.—Sometimes a lawn needs renovation in patches, even when it is newly sown. Carefully rake over the bare spots, then mix grass seed and soil one ounce of seed to a 5-in. pot of soil and sow the raked areas generously. Rake them and roll.

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Germinated seed, which birds do not care for, can be used to patch holes in old or new lawns. To prepare this, add 1 lb. of grass seed to a bushel of good, fine soil. Spread it out in a shed, damp it, and let it germinate. When the shoots are just visible, scatter a layer over bare patches, patting it down gently with a spade. Leave for a few days till the germinating seeds have righted themselves, and then roll.

Worms are among the worst enemies of new lawns. They must be destroyed as soon as possible, or they will do so much harm by loosening the soil round the young grass that the gardener will find it extremely difficult to get good results.

A lawn is never finished. When the seed has been sown there is still much work to be done. In fact as long as it is in existence as a lawn, the gardener cannot afford to slacken his periodic applications of grass fertilizer, his constant attacks on weeds, his frequent mowings and rollings, and occasional re-sowings of bare patches.

A Lawn from Turf.—The *speediest* method of making a lawn is to procure and lay turf, but it is no less trouble than seed sowing, and much more expensive.

If speed is the main consideration, kinds of turf must be considered.

Cumberland turf is the best available. Then Down or Moorland turf. Meadow turf is very inferior, though it will make a good lawn in time, but only after much expense in the use of lawn sand and fertilizers, seed for patching and so on. None arrive free from weeds, but meadow turf tends to be coarse, and to contain a super-abundance of dormant weed seeds.

Having decided on the kind of turf, the next step is the preparation of the ground.

Preparing the Ground.—Dig the soil to a depth of 9 in. If it is light soil, carefully mix in wellrotted manure, with the upper 3 in., at the rate of a load to every hundred square yards, or spent hops ($\frac{1}{2}$ lb. per square yard). For heavy soils short straw manure is better.

Just before laying the turf, rake the top layer of soil all over, to loosen it so that the roots will work into it, and so bind turf and soil together. Turf is cut in 1 ft. squares or in strips 1 ft. by 3 ft. If they are not to be laid immediately, they should be kept somewhere shady and cool. Lay them while they are still fresh and green, but before doing so go carefully over them, and pull out all weeds. It is obviously much easier to do this before they are put down.

They must be packed very closely together, preferably in a pattern similar to that employed by bricklayers in laying bricks. Dress after laying with finely sifted soil mixed with grass seed, brushing this between the cracks with a birch broom (2 lb. of grass seed to a barrow load of soil),

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they will then need to be well watered, and beaten with a turf mallet, or with the back of the spade.

It will be necessary to water frequently for the first few weeks if the weather is dry, and rolling must follow each mowing. Afterwards, $\frac{1}{2}$ in. dressing of ordinary sharp sand or fine breeze can be used over the surface.

Turf should always be laid in fine weather, in spring or autumn. Autumn is the better time, and autumn laid turves will make a lawn usable for any purpose the following summer.

Lawn Fertilizers.—A lawn must be treated with fertilizers at least every year, and more often if used a great deal.

In ordinary grass land, the grass dies down when the end of the season comes, and the decaying leaves are taken below by worms to form grass food, which enriches the soil. In a lawn, however, this natural feeding only happens if the lawn is *mown regularly without the box*, the short grass being left on the surface. Even when this is done a lawn does need some help in the matter of plant food, and responds to a well balanced fertilizer.

If the turf of a lawn is treated with sulphate of ammonia, but *no lime*, once a month from March to October, few weeds or coarse grass are able to grow, the finer grasses alone being left. This theory is still being tested, but appears to be working well in practice. In any case, sulphate of ammonia is one of the most useful chemicals for storage by those who take a pride in their lawns (*but it must only be applied in small doses*).

The minerals used as lawn fertilizers consist of either some natural form of rock e.g. rock phosphates, or some manufactured material, such as sulphate of ammonia.

The organic fertilizers used are made of animal refuse of various forms, manure, bones, etc. Manures are becoming increasingly scarce, ordinary road sweepings cannot be used for lawns, because these invariably contain the seeds of weeds, and may contain tar, which is injurious to plant life. Chemical fertilizers are therefore more commonly used, either in the form of soluble fertilizers or as dressings.

What is Missing?—Lime is advisable in most cases, and if the soil is deficient in this, it can best be remedied by using calcium carbonate during the winter months. Charcoal helps to purify and sweeten sour soil, fixes nitrogen, and makes the grass greener. It should be used between October and February, in powdered form, at the rate of about 1 lb. to the square yard. There are many brands of fertilizers on the market, each intended to balance some discrepancy in the soil. For this purpose they are listed under three headings: Acid, Neutral and Alkaline, and they must not be used indiscriminately, for what suits one lawn is fatal to another.

THE LAWN—ITS MAKING AND UPKEEP

Weak grass on *light* soil benefits by the application of 1 oz. sulphate of potash per square yard, in March, whereas poor grass growing on *heavy* soil is improved by double that quantity of bone-meal given in October or February. Bone-meal encourages clover growth, so, if preferred, 1 oz. each of bone-meal and superphosphate of lime can be given, but the super-phosphate must not be used when the soil is deficient in lime.

When damp, sour soil is the cause of weak grass; fresh slaked lime or pulverized chalk will correct the trouble. (Moss usually appears in such cases.) 10 oz. per square yard will sweeten the soil, and should be followed by raking with a moss-rake or by piercing the surface with the prongs of a garden fork to let in air to the soil and roots.

Coarse rank grass, growing on heavy soil, is improved by a $\frac{1}{2}$ in. dressing in February of clean, sharp sea or river sand well screened, or by a dressing of sifted coal ashes.

Scorched grass, on light sandy soil, is best dressed with equal parts of fibrous loam and leaf-mould, with a sprinkling of guano or soot, applied $\frac{1}{2}$ in. thick, in February.

Scorched grass, on heavy soil, responds to a dressing in February of nitrate of soda, at the rate of $\frac{1}{2}$ in. to the square yard, which discourages clover and encourages the growth of the grass.

Mossy lawns need treating with soot (six months old, stored dry), sufficient to blacken the grass, in October or November, and if possible before rain.

Of general usefulness are applications of 1 oz. each of basic slag and kainit per square yard in November, and 1 oz. of superphosphate of lime plus $\frac{1}{2}$ oz. of sulphate of ammonia in March.

Soluble Fertilizers.—The easiest way to apply soluble fertilizers to the lawn in an even manner, is to divide the lawn into so many parts, and then divide the solution accordingly. Dilute with the required amount of water, and do one section at a time. If the solution is made in a watering can it can then be used straight away. Always stir well before use.

Liquid manure can be made from any good complete lawn fertilizer. A small amount of sulphate of iron (not more than $\frac{1}{2}$ oz. to the square yard) can be added and greatly improves the colour of the grass.

Top Dressings.—Can be made from anything that will decay, such as all kinds of manure, leaves, turf, and waste vegetation (excepting grass cuttings that come from a weedy lawn, which are better rotted down separately with lime). Soil from old hotbeds, leaf-mould, breeze, sand, etc., may be used. The time this will take to decay will vary, but may be a year. Lime will hasten the process. The compost is better turned over now and again, and watered if necessary.

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Before using, put the compost through a $\frac{1}{2}$ -in. mesh sieve. The best time of the year to use compost on the lawn is in winter, spreading about $\frac{1}{4}$ -in. thickness all over the surface.

Lawns should be treated with fertilizers at least once a year, but better results are obtained if the applications are made in small doses, every three weeks, than if the whole quantity prescribed is put on at once. Always, when applying commercial lawn fertilizers, keep strictly to the directions given by the makers, noting particularly the quantity for each square yard. Dry fertilizers are best applied in showery weather, and well worked into the roots with a stiff garden broom. When the work has to be done in dry weather, water the lawn well afterwards.

Recent research done under the auspices of the Imperial Chemical Company at Jealott's Hill farm have shown that if quick-acting fertilizer is applied to the lawn in February (that is before the normal growing season) the roots begin to use it immediately, that is to say, *roots of plants are active before the tops* begin to grow. Amateurs are therefore advised to apply soluble fertilizers *earlier* in the season than usual, *rather than to delay* until the summer is well advanced.

To apply dry fertilizer evenly, mix it with four times its bulk of dry soil or sand. It will be easier to broadcast, and will not be so likely to burn the grass.

FIGHT THE WEEDS

The chief weeds which grow in a lawn are daisies, dandelions, buttercups, white clover, yarrow, plantains and moss, and as most of these ripen and shed their seeds by the end of June, it is obvious that they are best treated before that time.

With the surface-rooting ones, such as buttercup and yarrow, and the short-rooted rosette plants like the plantains, the best plan is to pull them out by hand, using when necessary a small weeding fork. For dandelions, a flat-pronged digging fork may be needed, their roots run so deep. If not carefully pulled out, a small piece of dandelion root will grow again into another plant.

When you weed, work systematically over the lawn, section by section until every weed has gone.

Have at hand some grass seed mixed with fine sand, and as the weeds are removed, fill up the holes with this mixture. Press the soil down hard, and afterwards roll, but do not water the lawn.

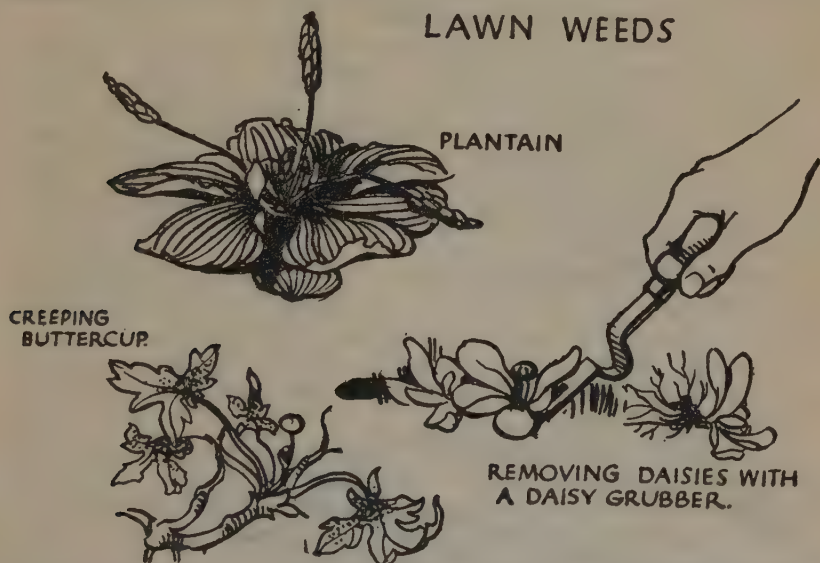
Weeds are only "plants in the wrong place" as a poppy is among the corn. Their growth is a natural occurrence, and every gardener has to wage an endless war against them. One thorough weeding will not finish the matter; on the contrary, unless the weeds are kept under control *they* will finish the lawn.

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The use of weed-killers will, however, reduce labour to some extent, and the weed-killer most commonly used is lawn sand. This is broadcast over the lawn at the rate of 2 oz. per square yard. Any bright day in the year will serve for this broadcast. Lawn sand can be made by mixing 14 lb. of sand with 3 lb. of sulphate of ammonia and 1 lb. sulphate of iron, or it may be bought in small bags, ready mixed.

Lawn sand burns the grass and for a week or so it will blacken weeds and grass alike, yet, after that time, the grass will revive and be all the better. Any further weeds that make their appearance may be spot-treated.

LAWN WEEDS



Small patches of lawn weeds can be removed by hand but a badly-infested lawn should be treated with lawn sand

Spot Treatment.—This consists in putting a small spoonful of lawn sand in the centre of each weed. Plantains can be killed by cutting off the tops and putting a pinch of lawn sand on to the stumps.

Weeds with long tap roots, such as dandelions, can be quickly destroyed by squirting a little liquid weed-killer into the centre of the crown of the plant. Prepare the weed-killer at double strength, then treat each plant and in a few days they will all be dead. Special tools, which, when pressed into the heart of the weed inject a spot of weed-killer, are sold by all sundriesmen. Other weeds can be treated in this way too, but the application of lawn sand is usually enough for weeds without tap roots.

A lawn which is unusually weedy should be dressed with $\frac{1}{2}$ oz. of

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sulphate of ammonia to the square yard once a fortnight all the summer. In order to allow for even distribution, mix the sulphate with ash or fine sand, and dust carefully over the lawn, section by section.

Newly-sown lawns should always be weeded by hand. In showery weather the weeds can be pulled out without harming the surface of the lawn.

GENERAL CARE OF LAWNS

The lawn should never be rolled when it is wet and sodden, as this causes a hard crust to form on the surface, impedes drainage, and prevents air from getting to the roots of the grass.

Rolling should be done on a fine day when the weather is not too dry, or frosty. It is only intended to spread or "tiller" the grass, and keep the surface even, not to level the lawn.

It is advisable to roll lawns periodically in the winter, as well as in summer, altering the direction of the rolls from time to time.

Never let the grass on a lawn grow longer than 2 in., otherwise it will immediately start to deteriorate and take a long time to get back into condition.

Mow your lawn occasionally during the winter months, but choose a fine day for doing so, for grass still grows during the cold months, and, unless it is cut now and again, becomes ragged and untidy.

A lawn should be cut twice a week at least in the growing season. Before mowing the lawn sweep the grass clear of worm casts. These tend to injure the machine.

If grass is left to grow the whole winter it may have to be scythed. Do this as early in the morning as possible while it is full of moisture and the stems are stiff. Limp grass makes the work of scything harder.

Keep the mowing machine in tip-top condition, and see that it is brushed clean, and oiled, before it is put away.

Early morning mowing should be preceded by rolling, as the grass is not so likely to cling to the rollers, and make the machine run rather heavily.

Watering.—The best time to water the lawn is early in the evening, when the great heat of the day is passed. If water is given in the day time the hot sun and air dry the moisture up so quickly that the grass gets very little benefit from it. The best method is to use a garden hose fitted with a fine rose, and to hold it so that it throws the water up into the air, and moistens the ground gradually, or to use a fine-spray sprinkler put on for an hour or so. To pour water direct on to the lawn and saturate it in places is a mistake.

It is a wise rule not to water an established lawn unless absolutely necessary. If watering is commenced it will have to be continued at

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least once a week during the dry spell. In place of this, run the mowing machine over the lawn frequently, and *leave the grass lying where it falls*, so that it may form a protection to the lawn. There are two or three exceptions to the rule of not watering a lawn. In the case of a young lawn not fully grown, the grass seed requires water every day, morning and evening, until it has become firmly established.

The same applies to a lawn newly turfed. Unless this is kept watered until the surface is set, and the grass well rooted, it will dry out, and wear patchy. The third exception is the games lawn, where hard use makes daily watering a necessity.



FAIRY RING FUNGUS



SPIRAL CAP



SULPHUR-
TUFT.

APPENDAGE
AGARIC

Fairy rings in the lawn are the result of a fungus. This and other fungi are destroyed by using a dressing of one ounce of copper sulphate in a gallon of water

CHAPTER XV

GARDEN OPERATIONS — DIGGING — MANURING — PLANTING — HOEING — SOWING AND OTHER METHODS OF PLANT PROPAGATION

GARDEN OPERATIONS

ONE of the greatest difficulties to the novice in gardening is that of following instructions given in technical gardening papers and books, without any knowledge of practical gardening, and, therefore, without understanding the terms used. For instance, the writer has been approached on numerous occasions by amateur gardeners with the questions: "How do you use a hoe?" "What does pricking off mean?" "What is a drill?" and so on.

It is to help such inexperienced novices that this chapter is intended and, as far as possible, all the ordinary garden operations will be described here.

The first and most important operation of all is, of course, digging. The experienced gardener can dig about three times as easily and certainly three times as quickly as the novice. The aches and pains of which the novice complains after a day's digging are often more due to the wrong use of the tools than to the work itself. A spade should be kept in a clean, bright, sharp condition; this is the first essential. The spade is used on all kinds of soil that have been previously dug, and on light soil at all times. It will not be possible to use the spade alone for the first digging on heavy, stony land that has been lying idle for some time.

When using the spade, the right hand should be on the top of the handle, and the left hand half-way down the shaft. The spade should be first lifted from the ground and then driven downwards so that the blade cuts into the soil vertically. If the spade is driven in at an angle, instead of vertically, it does not penetrate so deeply, and it does not cut a clean-sided trench.

The blade should penetrate to its whole depth, and for this it will probably require the assistance of the foot. When the blade has entered the soil the spade should be levered a little backwards and forwards to loosen a solid cube of soil, which will then be lifted on the spade, and turned completely over as it is returned to the plot.

This is the simple digging process, but it is much easier to carry out the general work of digging a border if a trench is first opened. Digging

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with a trench can be done in several different ways according to the soil, and the use to which the plot is to be put.

Double digging, or bastard trenching.—This form of digging is dealt with first because it is not only the commonest, but is definitely the *best* way to deal with soil in most cases. It is called double digging because two layers of soil are broken up during the process. Although the two layers are broken, they are left at the same level on the plot as



DIGGING IN LIME

Lime should be scattered over the soil surface before digging commences so that the two operations are carried out at once

before, that is to say, the sub-soil is left below, and the top soil still remains on the surface. The procedure is as follows:

First dig a trench across one end of the plot or border that is to be dug. The trench should be as deep as the blade of the spade, and should be from 12-15 in. wide. The soil taken from this trench should be piled in a heap at one side, or wheeled immediately to the far end of the plot where the digging will be finished. Now get into the trench and with the large digging fork break up the soil at the bottom of the trench as deeply as you can. Throw into the trench over this broken bottom,

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any manure, old leaves, or other animal or vegetable matter such as vegetable parings, old bones, etc. Then turn the next 12 or 15 in. of soil over into this trench, leaving a second trench of similar width and depth. Repeat this process until you get to the last trench, which will be filled in with the soil taken from the first trench.

If you are dealing with new gardens where the soil is composed of pasture land, the easiest thing to do is to stretch a line across the plot from one side to the other before taking out the first trench. Use the spade to cut a straight edge through the turf alongside this line. Then move the line 15 in. from this cut and make a second cut right across the plot. Short cuts at right angles between these will divide the turf into squares.

As the trenches are opened, each square of turf can first be sliced off with the spade and turned *upside down* at the bottom of the trench. It will decay there and make a good substitute for stable manure or leaves. It is much wiser to use the turf in this way than to follow the practice that is sometimes adopted of burning the turf. The grass decays, and forms the finest possible loam, whereas if the turf is burned, most of the manurial value is lost. A point to be remembered, of course, is to watch for wireworms, which will probably be troublesome on old pasture land, but which can effectively be destroyed by the modern method of using soil fumigant. If any of these pests are noticed, a dressing of commercial fumigant, or a mixture as recommended in Chapter XVIII should be dusted in the trenches during digging.

When bastard trenching has been completed, the soil needs a dressing of lime in all cases except where special lime-hating plants are to be cultivated. The lime can be scattered over the surface of the ground, to be washed in by rains. As lime has the effect of breaking up large lumps of stiff soil, the gardener will save his own labour if he digs his ground early in the winter, and leaves the surface rough, adding a good dressing of lime, say about 4 oz. to the sq. yd. on virgin soil. In spring it will seem easy to work, instead of hard and lumpy.

Trenching.—When ground is *trenched*, it is dug and turned two spits deep, that is twice the depth of the spade blade. At the same time the soil of the bottom layer is brought to the top. This operation is seldom performed, because the top layer of soil under cultivation is always the more fertile. Fertility depends not only on a supply of the chemicals which are regarded as plant food, but also on the presence of useful bacteria in the soil.

In soil that is well aerated, warmed by the sun's rays, and kept fairly moist at all seasons, the useful bacteria thrive. Sub-soil is never so well aerated, and may at times be waterlogged, and the useful organisms are therefore fewer in the under layer of the soil.

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In addition, in most soils there is more humus in the top layer, as it is the top layer which receives the decayed leaves and plant-tops each autumn. The humus improves the soil texture and makes it more workable and also a more congenial home for plant roots. Although the fertile soil should be kept at the top, the mechanical condition of the sub-soil is of quite as great importance to the health of the plants as is the fertility of the top layer. Plant roots will sometimes go down to a surprising depth, often to several feet below the surface, in well-tilled land. Wherever the roots are, they need air and moisture to remain healthy, and unless the sub-soil is well broken up, air cannot penetrate. If the sub-soil is broken, however, the roots at a great depth can still use plant food from the top layer, as plant foods are always absorbed in solution, and the moisture that drains through from the top soil will carry sufficient food down with it to the deepest roots.

It might be thought from this that there would never be any need to bring the sub-soil to the surface, but trenching is desirable in two cases. One is in the very common case of a new garden, where the builder has excavated considerable quantities of sticky clay when preparing the foundations of the house and has spread this over the surface of the garden. In such a case the first job for the gardener is to bring the fertile soil to the surface. The other case where trenching is desirable is in a very old, exhausted garden, such as some town gardens. Bringing up *some* of the sub-soil will improve the condition of the borders, but only a little should be brought to the surface, and that should be mixed well with the original spit.

The easiest way to trench is to open out a very wide trench first of all, in the same way as is done for bastard trenching. If the trench is double width, that is about 30 in. wide at the top, the work will be made easier. Dig the trench so that the first 15 in. width at the end of the plot is 2 spits deep, and the second 15 in., 1 spit deep. Keep the fertile top soil in one heap and the sub-soil in another. Wheel both to the end of the plot where the digging will be finished. Now take the top soil from the third 15 in. width and turn it over into the bottom of the first trench. Next turn the second width of sub-soil on to the top of this first trench.

[This again leaves a trench 2 spits deep in the first half and 1 spit deep in the second half.]

Forking.—Bastard trenching can obviously only be done where the soil is vacant, and although most border flowers and vegetable crops can, or should be, lifted from time to time, there are always a number of border plants, such as established shrubs and certain fleshy-rooted perennials like peonies, which are never lifted, or only lifted at very rare intervals. It is necessary, however, during the winter months, to fork over the soil

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between plants of this type, to keep the surface clean, and also to assist in soil aeration; for such work the large garden fork is used.

When the soil surface is being stirred for the purpose of burying leaves and weeds, it is not wise to drive the fork in vertically, as this generally results in too much root disturbance. The fork should only lift the top layer of about 3 in. of soil, and turn it over so that all the rubbish is buried.

Particular attention should be paid to this point when dressing the soil of raspberry beds, and similar shallow-rooting shrubs. Many a plantation is unfruitful for no other reason than because it is too roughly treated at the hands of the jobbing gardener.

Manuring.—Plants take the bulk of their food from the air, and from water that falls in the form of rain, but the small percentage that comes from the soil itself is so important that plants cannot thrive without it. As would naturally be expected where plants are grown year after year in the same soil, they gradually rob the soil of the particular chemicals that are taken up by the roots. Unless the loss is made good in some way, the soil will naturally become less and less fertile. Before this fact was realized and before the importance of manure and fertilizers was understood, the old-fashioned farmer used to leave land idle for a year every now and then, in order that it should recover its fertility. This is no longer necessary, as by the intelligent use of fertilizers and manures, land can be kept in good condition to yield not only one crop every year, but, if desired, to yield several crops each year, as is done under intensive cultivation. A common question asked by amateurs is: "Which is the best, stable manure or artificial fertilizers?" Until recently the usual answer given was that a certain amount of stable manure was essential, to be supplemented with artificial fertilizers. It becomes more and more possible, however, to rely on artificials, and chemical research is seeking a complete solution of the plant-feeding problem on these lines, partly because stable manure is not easily obtainable in many districts, but partly also because stable manure, for use in small gardens, has certain grave disadvantages.

There is, of course, no difference between plant foods such as nitrates when obtained from stable manure, or from artificial fertilizers, and as a source of food supply, therefore, neither has any particular advantage. But stable manure can seldom be obtained entirely free from weed seeds, animal pests, and disease spores. It follows, therefore, that when the plant foods can be supplied in the right proportions artificially, stable manure as a food can well be ignored. As a matter of fact, the real virtue of stable manure has never been its richness in plant food. Its chief use has been that it improves the *mechanical condition* of the soil, and makes it more *retentive* of *moisture*, and, therefore, of plant food.

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Other forms of organic manure such as shoddy, wool waste, leather scraps, horn, etc., take a considerable time before they are available as plant food. This is sometimes an advantage, but, in a number of cases, artificial fertilizers that act quickly are to be preferred.

All organic manure has a disadvantage also in the small garden in that it is bulky and difficult to store, for long periods, without being a nuisance.

As a general guide, therefore, the small gardener may take it that animal manure should only be used if a cheap local supply is available, if it can easily be stored without being offensive, or if it can be immediately dug into the soil. It certainly improves the condition of stiff clay soils and of light soils to add stable manure, but when once the garden has been brought into a stage of good cultivation, it can be kept thus by the use of artificial fertilizers alone. (For further particulars of Fertilizers see CHAPTER XVII.)

Planting.—The operation of planting is well enough known to every amateur gardener. It is an operation, however, which is frequently badly done. The most common fault is to plant too loosely in the soil. Unless the plant roots are *in actual contact with moist particles* they cannot draw nourishment from the soil. They dry out, and the plant becomes starved. After setting plants in a mixed herbaceous border it is a good practice to tread round each, to make sure that the plant is firm in the ground.

Another important point in planting is to allow the roots to be spread out to their fullest extent. For long roots, deep holes should be made and the soil levered against them. When the plants are set in position the roots must not be doubled up under them. If they are spreading surface roots, a very wide hole should be made, and the roots spread out horizontally and covered with fine soil, trodden firmly over them.

When planting is done on the vegetable plot it is best to use a line, such as is used for drawing seed drills. A spacing stick of the length that is to be allowed between each plant should also be used. Not only is the appearance of the plot improved by regular and even planting, but the actual work of maintenance is also eased.

In planting a mixed border, labels should always be put in before the plants are set in position. This not only makes it possible to plant more expeditiously, but it prevents any possibility of miscalculation, so that plants do not have to be shifted again after once being set in position.

Transplanting.—In planting out small seedlings, safety means a good deal. Tender young roots dry very quickly and one of the rules for planting is never to let the roots dry out. If the soil is dry, and the plants must be put out in their permanent positions, the practice of "puddling" is useful. In this each plant root is dipped in a mixture of

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mud, soot and water before it is set in position. This gives it a good start in life in its new home.

One important part in planting is to remember the estimated height and width of the plant, and to be sure to allow sufficient room. The general rule on the vegetable plot is to allow as much distance between the rows as the height of the plants when they are mature. This of course is varied slightly according to the type of plant, but can be taken as a rough guide.

In the mixed border some thought must be given to the plant's habit of growth. For instance, the Gladioli with thin sword-like leaves occupies comparatively little space. On the other hand a plant of Catmint, with spreading bushy growth, will take up at least an area of 18 in. each way in the border. A dwarf Dahlia may occupy little more than a square foot of soil, but some of the larger Dahlias need a space of 4 or 5 ft. sq. for full development.

Another important point in planting is to be sure that fresh manure, if it is being used, does not come in actual contact with the plant roots; it is likely to set up decay. A little fine soil of fairly poor character thrown over the fibrous plant roots is better than over-rich soil.

Always leave the surface of a flower bed or vegetable plot tidy after planting. Although the plants may be trodden round, in order to ensure firmness, the surface soil when the planting is completed should be lightly loosened with a rake or fork. During periods of drought, an addition of a mulch of old, well-decayed stable manure or leaf-soil round newly-planted seedlings or plants will see them safely through the hot dry days.

Planting Trees and Shrubs.—In the larger planting operations, the essential thing is preparation of the soil. Shrubs and trees remain where they are, undisturbed, probably for the remainder of their lives. It is not possible later on to do much to improve the soil drainage. Preparation for any large shrub or tree, therefore, should include digging to a depth of at least 3 ft. At the bottom of the holes that are taken out all the roughest materials available should be thrown, such as flints, old cans, broken bricks, clinker, etc. Over this the coarsest soil should be put, together with manure, which will help to supply moisture to the plant roots in dry weather. The remainder of the soil filled in will depend on the type of tree or shrub. For Rhododendrons peat will be used, for instance, and for Apricots a sandy loam.

In all the larger planting operations, preparation of stakes beforehand is desirable. Every tree, shrub or Rose plant should be staked at planting time, and the best time to put in the stake is before the plant roots are covered. This is particularly important if the planting is a one man job. For instance, if an apple tree is being planted, and the

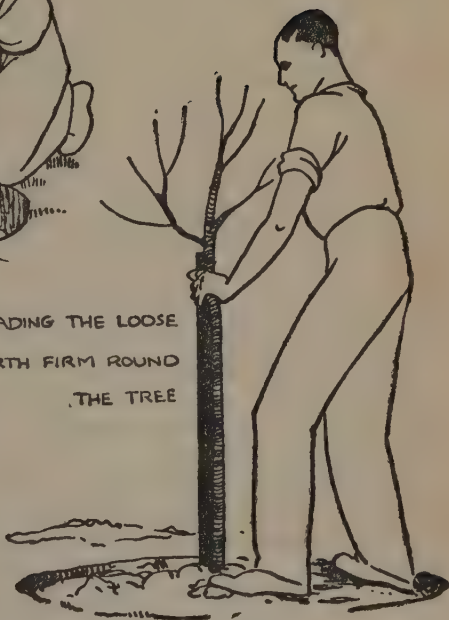
GARDEN OPERATIONS

PLANTING A TREE.

SPREADING ROOTS OUT ON SURFACE
OF LOOSE, WELL-FORKED SOIL.



TREADING THE LOOSE
EARTH FIRM ROUND
THE TREE



THE CORRECTLY PLANTED
TREE.

The great art of planting is to plant firmly. In the case of a tree, tread the soil down after each layer of soil is placed in the hole

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hole is taken out first, and a stake driven in, the tree can be tied to the stake *before the soil is filled in*. In that case it will not be necessary to have an assistant to hold the tree, and the accurate level at which the tree is being planted can be better estimated. Firm planting is particularly desirable in the case of trees and shrubs.

A practice adopted by old-fashioned gardeners is to rest each tree on a small mound of rather rough poor material (gravel, for instance) in the centre of the hole. This is said to induce earlier fruiting and flowering.

Before covering the roots with soil, they should be thoroughly examined, and any broken or damaged portions should be cut cleanly away with a knife. This will do much to prevent the access of disease pores.

Hoeing.—The operation of hoeing is frequently misunderstood by the novice. Hoeing is practised for two reasons. The operation consists in either pushing or drawing the blade of the hoe through the top 2 or 3 in. of soil in such a manner that all weeds are chipped off. But weeding is only one of the reasons for hoeing, and perhaps it is the least important.

The other reason is that it keeps the surface of the soil in a broken friable condition. This prevents the loss of much soil moisture drawn to the surface by capillary attraction. If the top surface is loose, and no deep cracks occur, the loss of moisture is reduced. This fact has been proved over and over again by experiments on hoed and unhoed land. It is found that the soil is cooler and moister in summer if it is regularly hoed, while in winter it is warmer.

There are two main types of hoe: the Dutch hoe or thrust hoe, which is used with a pushing motion, walking backwards across the plot, and the draw hoe or potato hoe, which is used with a reverse motion, the operator walking forwards.

The hoe cannot be used unless there is room for it between the rows of plants. That is partly why seedlings in nursery beds are sown in drills at least 6 in. apart. This leaves sufficient room for a small hoe to be used between them.

If very fine flower seeds are developing and the seed bed appears to be smothered in weeds, it will be found easy to hoe if a couple of strings are stretched across the bed just over the rows of seedlings. This draws attention to their position so that the hoe does not go astray.

The hoe is sometimes used for thinning out seedlings in the rows, as well as for checking the weeds between the rows.

Weeding.—In a mixed flower border where the flowers are not spaced in regular formation, the hoe is not always a useful tool. In such a case the surface of the soil should be kept free between the plants with a small handfork. For instance, in the early part of the year when bulbs are just showing through the soil, the handfork should be used to

GARDEN OPERATIONS

break the soil surface, and from that time on, throughout the summer, it should be used as frequently as possible. The more often the top layer of soil is stirred, the better for the health of the plants, but on no account should the soil be stirred deeply, otherwise the roots may be damaged.

Seed Sowing.—Seed sowing seems a simple operation, yet there are some gardeners who quite regularly obtain good results from seed sowing, and others who almost as frequently fail.

The difference is due to lack of understanding, and sometimes to lack of care.

Seed sowing is Nature's method of obtaining new, healthy plants, and also of obtaining new varieties. The natural ways of sowing seeds are extremely varied and interesting. Some seeds are dispersed by the wind, some are dispersed by birds or other animals and a large number are dispersed by the simple method of being dropped or thrown on to the soil near the parent plant.

In any case the natural time for seed sowing is usually immediately the seed is ripe, and the gardener finds in practice that this method is very satisfactory. That is to say, if new seeds can be obtained just after the season of flowering and sown at once, practically one hundred per cent. of the seeds will germinate and make new plants.

In some cases, however, it is not convenient to sow the seed immediately it has ripened. Even in nature, certain seeds will lie dormant during the winter months and only waken to new life during the spring.

The gardener uses seeds of plants which are not hardy enough to stand in the open garden all winter in this country. To sow seeds of this type in late autumn would often be fatal. The chief seed-sowing time of the gardener's year is therefore the spring.

Why Good Seed is Costly.—The novice in gardening sometimes looks at the forming seed pods on his garden flowers, and noticing how prolific Nature is, he begins to inquire why seeds of certain flowers and vegetables are so costly in the shops.

The reasons are many. In the first place the seed which the gardener receives in seed packets is harvested, properly ripened, cleaned and packeted, and this involves a certain amount of labour, apart from distribution costs. But these costs are relatively small compared with the amount of work put into the production of seed of *good quality*.

Every seed is a new life, a new individual that re-inherits a combination of the characteristics of two parents, thus each seedling may differ from the plants of any preceding generation. If seed is gathered from an ordinary garden where several varieties of flowers are grown the probability is that the two parents, whose characteristics are being passed on into the next generation, are different in colour or form.

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The offspring, or new seeds, may in such cases, be like one or other of the parents, or partly like each, or they may show the characteristics of grandparents, or of generations even further back.

This means that seeds gathered from the ordinary garden probably vary considerably in form and colour. Seed which is obtained from horticultural seedsmen is protected as far as possible from varieties caused by cross-fertilization. Seed of single variety is grown in each seed bed, and "rogues," that is, plants which differ from the type, are regularly taken out before they seed. In this way seed is produced which comes practically true to type in every case.

In addition to this care about the variety of the strain, there is an enormous amount of work put in by special raisers on the development of new forms in flowers. New varieties, the seed of which is scarce in commerce, are naturally more costly than older varieties, the seed of which can be obtained freely from a number of sources.

It is this work which is paid for in the expensive seed packets, and the money paid is well invested.

It takes the amateur gardener as much time and trouble to raise a packet of cheap seeds of inferior quality, as it does to raise plants of good quality from the best seed. It occupies just as much garden space, and the results are in no way comparable.

The importance of obtaining the best quality seed cannot therefore be over-rated.

How to Sow Seed.—Sowing operations vary considerably according to the type of seed, where it is sown and where it is to be grown.

Perhaps the simplest of all seed-sowing operations is the one which every child at some time or other carries out, that is, the sowing of mustard and cress. This seed is sown either in the open garden, on finely raked patches of soil, or in boxes of soil, or on pieces of flannel, and beyond keeping the soil or flannel moist, so that the seed germinates, no attention is given. It is even unnecessary to cover these seeds with soil; they are merely sown thickly, pressed down flat on to the soil surface, and kept moist by being covered with pieces of paper or mats.

From the fact that mustard and cress grows as it does on pieces of flannel with only water, it can be seen that seed, to germinate, requires only moisture and a certain degree of warmth. The process of germination is entirely mechanical. At first the seed is dry, and covered by a skin or shell. If moisture is given, the seed swells and the outer skin bursts. When this has occurred the seed wants, like a newly-born child, air, as well as food and warmth. That is why seed must be sown on soil which is porous and open in character, and into which air can easily penetrate

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The first step in seed sowing is to prepare the soil so that at least the top 2 or 3 in. is porous and open. It must also be broken very finely, otherwise large clods of earth might cover fine seeds and the seedlings would be unable to push their way up into the daylight.

Outdoor Sowing.—Seeds are sown in the open in two ways, broadcast and in drills. Broadcast sowing merely means that the seeds are thrown as evenly as possible all over the surface of the soil. This is the method that amateurs generally adopt for sowing annual flowers in the mixed border.

The mistake which is most common is in sowing the seeds too thickly. It is not easy to sow fine seed so thinly that when it comes up seedlings will not be overcrowded. In fact, it is impossible. However, if fine seed is mixed with sand before sowing, it will distribute more evenly and less thickly. This method is often adopted with expensive seeds.

Another good practice in sowing a patch of flower seeds, where seed is scarce and the seedlings are expected to occupy considerable space when they develop, is to divide up the patch to be sown (in imagination or reality) into a number of squares, and to sow seed in each square. If the squares are spaced so that one seedling growing in each square will be sufficient, the operation of thinning will be greatly simplified.

As an example: If a few seeds of a new Marigold are being sown, they can be sown 10 in. apart, using about three seeds on each station. As they germinate, the two weakest will be removed, and only the strongest seedlings left to grow on to maturity.

In the case of certain dwarf plants such as Virginian Stock, Scarlet Flax, Nemophila, and Phacelia campanulata, no thinning is necessary if the seeds are distributed as widely as possible when they are being sown. As in the case of sowing mustard, it is essential that *each seed that falls on the ground should be in actual contact with moist soil*, for the process of germination to begin. It is therefore advisable to throw a little sand or fine soil over the seed after sowing, or to rake the surface a little so that the seed automatically falls into the cracks of the soil, and then to complete the task by pressing the soil down with the back of the spade, or with a trowel or rake.

In dry weather always water the soil after sowing seed outdoors to give the seeds a start.

But with this reservation—if the soil is sticky clay, do not water heavily unless you have used only sand as a surface covering. Sticky soil may easily become caked over seeds and delay or prevent growth. Carrots frequently fail for this reason.

Sowing in Drills.—A drill is actually a shallow V-shaped trench drawn along a straight line, using the edge of the rake, the point of a triangular hoe or some other similar pointed tool. In order to keep the

rows straight, so that the hoe can be used between the seedlings easily, a line of string is usually stretched across the border, or plot, each end of the string being attached to a peg which is driven in to hold the string taut.

When seeds are sown on an allotment, or vegetable patch, each drill is drawn by the side of the string, and the string is then moved on 12, 15, or 18 in., as desired, so that the next line of seeds is exactly parallel with the first.

In this type of sowing the seeds are, as a rule, scattered thinly along the drill. Here again, however, with expensive seed it is possible to economize by sowing a pinch of seed at regular intervals along the drill, in the places where each matured plant will be. For instance, an expensive new variety of carrot can be made to go a good deal farther if a pinch of seed is sown every 6 in. along the drill. As the seedlings germinate they will be reduced to one at each station, and later, if the carrots need more room, each alternate root will be pulled out for use in salad or soup, while the rest are allowed full room for development.

In the case of drills, the seed can either be lightly covered with a sprinkling of additional soil, or the rake can be used to cover them, raking always in the same direction as the drill. The back of the rake often makes a handier tool for this purpose than any other. As before, the seed-sowing operation should be completed by pressing down the soil over the seeds with the rake (held vertically).

Seeds Under Glass.—Seeds under glass are sown (1) in the soil of the cold frame, (2) in seed boxes, usually 3 or 4 in. deep, and (3) in pots.

Seed Boxes.—Seed boxes can be any depth according to the type of seed, but the majority of fine seeds are sown in boxes 3 or 4 in. deep, filled to within an inch of the top with old sandy soil. As a rule, the boxes used are rather badly fitting, therefore the surplus water freely escapes between the joints and there is no need to provide extra drainage holes. Should a box be selected that does not allow the free escape of water, drainage holes will be burnt or drilled in the bottom.

For ordinary seed sowing, a layer of dried leaves in the bottom of the box is usually the best material. It keeps the soil from washing away and also allows free drainage. The soil used can be any ordinary garden soil, to which plenty of sand has been added. It is lightly filled in, after sifting, so that the box is just level full, and then it is gently pressed down with a piece of flat board, so that the surface comes about an inch below the rim.

Shallow drills, for ease in sowing fine seed, can be made by pressing one edge of the piece of board into the surface. Costly seeds, sown sparingly along such shallow drills in the boxes go farther and need

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less transplanting than if the seed is sown thickly all over the surface. Cover the seed with fine dry soil, or sand.

It is always a mistake to cover seeds too thickly. Nature's method of seed sowing is to scatter them on the soil surface, and let them fall into the cracks. The only case in which a rather heavier covering of soil is used is when seeds are sown in the open garden in the hottest weather. If they are lying too near the surface the seedlings are often killed by the dry conditions, even if germination takes place.



**BELLOWS
USED FOR DUSTING FLOWERS
OF SULPHUR**

SYRINGING EARLY

Syringing is the usual method of controlling pests out of doors, while dusting is successful with indoor plants

Seed boxes are best watered *before* the seed is sown. If they need watering afterwards, before the seedlings have appeared, it is best to do it by half immersing the box in a bath of tepid water. Care must always be taken not to wash fine seeds out of the boxes, pans, or pots in the process.

Seed Sowing in Pots.—Where pots are used for seeds it is usual to provide crock drainage at the bottom of the pot, about a third of the distance up the pot, and to use a certain amount of decayed leaf soil with sand in the upper part of the pot. Seedlings are frequently grown on in the pot longer than they would be in seed boxes, and on leafy compost, or leaves, in the lower layer help to feed them. Otherwise sowing is the same. Large seeds are, of course, sown singly in pots, or

in the soil of the boxes, being pressed in, 2 or 3 in. apart. The rule for seed sowing is to cover the seeds with twice their own depth of soil.

Alpine plants from Seed.—Very rare alpines are often sown in shallow pans filled with extra fine sandy soil. Because they are so rare, and so fine, and may take a good time to germinate, the amateur must be specially careful over watering, so that the seeds are not washed out. A very useful practice in raising alpine seeds is to use double pans. The seeds are sown in one pan, which is plunged up to the rim in a larger pan containing similar sandy soil. When water is necessary the outer pan only is watered and the moisture gradually finds its way into the inner pan. This prevents any possibility of washing seeds away. Alternatively the seeds can be sown in the outer rim and water given in the inside pan only. Such fine seeds are covered with sandy soil sifted through a fine gauze.

Seeds of Shrubs and Trees.—Amateur gardeners do not always realize that they can raise many varieties of shrubs and trees from seed by gathering berries, such as Holly berries. It is best to keep them for a time, and the usual way is to pack the berries into sand and leave them for anything from 6 to 12 months. At the end of this time (or when convenient) the seed and sand are sown together. The reason for this delay is that the outer covering of the berry has to rot away before the seeds are ready for sowing. In Nature, the berries might lie on the ground surface for a considerable time before the seeds began to grow.

Damping-off.—The most common trouble amongst seedlings is the disease known as "damping-off." This is a form of decay which attacks particularly seedlings that are injured in transplanting. It is also found amongst seedlings where ventilation is insufficient, or where too much moisture is used. It is to prevent the appearance of this disease that a very sandy compost is always used under glass.

An added precaution is to sterilize the soil before it is used. A solution of 4 oz. of formaldehyde to a gallon of water, poured over the soil before use, will almost certainly prevent the appearance of damping-off.

Should seedlings appear to be slightly affected, the disease can be prevented from spreading by watering them with a solution of permanganate of potash crystals, used at sufficient strength to make the water a *pale* rose colour.

Other Methods of Propagation.—Let us turn our attention for a few minutes to the structure of plants.

In every form of life, Nature appears to have a double object. In the first place, there is the development of the individual life in flowering plants—this is seen in the growth of the stems, branches, leaves, and in the second place the passing on of that life to a new life seen in the production of seeds. In the case of the original plant—animal cells which

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are believed to have been the origin of all the life on this planet, the difference is quite apparent. A single cell can increase itself by the simple method of splitting up into two parts. This is, in fact, merely a multiplication of the same cell life. It can also unite with another cell and then redivide. The result of this is that new lives are formed which partake of the characteristics of both parent cells.

Gardeners often take advantage of the non-sexual methods of reproduction when they have plants of a specially good type that they wish to increase. They have studied Nature's ways of multiplying special plants and they have adapted, and perhaps improved, on her methods. Apart from seed raising, every method of propagating plants practised in the garden results in the production of new plants which are identical with the parent. Some of the most common of these methods will be described.

Root Division.—The simplest of all methods of increasing the stock of plants is by root division. The greater number of the common garden perennial flowers, and a good many inhabitants of the kitchen garden, have roots which can easily be broken into pieces. Any plant which produces a root of this kind can be increased by simple division.

In the case of border plants that make a crowded mass of roots, such as Michaelmas Daisies and Heleniums, regular division is advisable even if an increase in stock is not wanted, to avoid overcrowding. If roots are left unchecked, they send up more stems than can comfortably be accommodated in the limited space they occupy and the resulting flowers and foliage are poor.

The easiest way to divide large clumps is to lift them bodily with a deep digging fork, and break off, either with a small handfork or trowel, the outer pieces of the clumps. This is where the newest roots are, and these new roots make the finest plants, and produce the best flowers. Very large overgrown clumps should never be replanted in the mixed border.

Should there be any difficulty in breaking a large clump into pieces, the best way is to drive in two handforks, back to back, into the centre of the plant, and then lever two pieces apart. This is often necessary in the case of plants where the root-stock is of a hard, stubborn nature.

Offsets.—Bulbous plants are frequently found, on lifting, to have a number of smaller bulbs attached to the old bulb. This again is a natural way of producing new plants which will be identical with the parent plant. These small bulbs or offsets can be taken off, and replanted just as if they were older plants. They will gradually increase in size until they are normal flowering plants. The formation of small bulbs is encouraged by damage to the base of a large bulb. This fact is taken advantage of where bulb growers wish to increase rapidly a stock of any particular bulb. They score across the base, and this results in the

formation of numerous new small bulbs. Similar small bulbs or bulbils are often found in the axils of the leaves, especially on lilies. These bulbils, removed and replanted, will also form new plants.

The amateur gardener who replants offsets or bulbils of any kind should always make a note of the variety of plant so that he can use them effectively when they reach flowering size.

Cutting Tubers.—Herbaceous plants which have a tuberous root-stock, such as the Dahlia, are often increased by cutting the tuber into pieces. Each piece cut should have an eye to it. Potatoes are frequently cut in this way when the seed bought is on the large side. It is generally recommended that any cut tubers should be allowed to remain in the air for a few hours, or days, before replanting. A skin or callous then forms over the cut, and disease spores from the soil are less likely to enter.

Root Cuttings.—Just as tuberous plants are increased by cutting the roots into portions, so can the fleshy roots of plants such as the Oriental Poppy be formed into root cuttings, to increase the stock. In the case of the Oriental Poppy, pieces of the root about the length of a finger are cut cleanly across, above and below, and planted vertically in the soil, with about two or three inches of soil above the top. Seakale is another plant which is increased in this way. This method of making root cuttings is even more certain to succeed than the method of taking cuttings from the leaf stems, and it is certainly a useful way of increasing rapidly many of the common herbaceous plants.

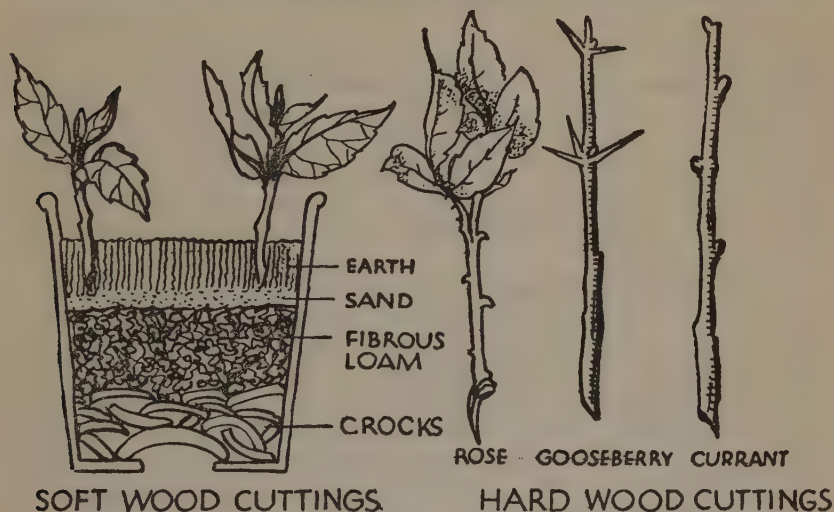
Cuttings.—Plants have the power of developing roots from almost any portion of the plant. That is why it is comparatively simple to raise fresh plants from cuttings. The only difficulty is that, as the new pieces inserted have no root, they are not able to take up moisture at the normal rate. If the atmosphere is dry, and the cutting inserted has a large leaf surface, from which moisture is being constantly given off the cutting dries and dies. By maintaining a moist atmosphere all round the cutting, the gardener makes it possible for the plant to keep moist while the roots are forming. Bell glasses (or jam jars) inverted over the plants, or the use of a propagating frame which is kept close shut, or the use of a closed cold frame, all serve the same purpose—that of keeping a stationary moist atmosphere round the cutting, until the roots have formed.

Cuttings of deciduous trees and shrubs are far best made at the end of summer, the reason being that there is no leaf surface in winter, and consequently little loss by evaporation. Plant roots form before the new leaves of spring call for more soil moisture. The difficulty that arises with cuttings under glass is that the stationary moist atmosphere may easily set up the disease known as “damping off.” In which case the plant dies as surely as if it were left to shrivel through dryness. To

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avoid trouble of this kind, cuttings are rooted either in pure sand, or very sandy compost. Actually cuttings root best in pure moist sand, but as soon as the roots begin to grow the plants demand a certain amount of food, which the sand does not contain. So that if a cutting can be rooted in a sandy compost, instead of pure sand, it is an advantage, as the new plant can be left without disturbance for a longer period.

A useful way to prevent damping-off amongst cuttings, is to sterilize both the cutting and the soil of the propagating frame before the cutting is inserted. Cuttings can be put into a weak, pale, rose-coloured solution of permanganate of potash crystals in water, for a few hours before they



Cuttings of all kinds appreciate a sprinkling of sand at the base to assist drainage

are to be inserted in the propagator. The sand or soil used for the propagating frame can be sterilized by watering well with the same solution.

Cuttings in the Open.—When it is intended to root cuttings in the open, there is always a certain amount of risk, and occasional losses will occur due to long periods of drought, etc. However, cuttings of many garden plants may be rooted comparatively easily. The secret is to choose pieces in just the right condition. Very hard wood does not send out roots so readily as does newer growth, but very new, tender, sappy growth is much more likely to suffer in dry or cold weather than are older leaves and stems. The best thing therefore is to choose *half-ripened* stems. (I find it best to cut off the rather tender tops of Rose cuttings, for instance, when inserting pieces of ramblers, etc., in the open garden, as I always do at pruning time.)

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Another point is to insert the cuttings at a time of the year when showers are likely to be frequent, and drying winds few, and also when the soil and atmosphere are warm, warmth being essential for production of new growth.

It is for these various reasons that cuttings of Roses and shrubs and of bedding plants such as Geraniums, Violas, etc., to be rooted outdoors, are usually taken towards the end of summer, that is in August and September. The cuttings are inserted in any shaded part of the garden, where bright sunshine will not dry them too rapidly, and as autumn showers can reasonably be expected, cuttings inserted at this time have the best possible chance of success.

Where to Cut.—In most plants it is found that roots form readily at the joints. The common practice is, therefore, to “make” a cutting by cutting immediately below the leaf joint. Some plants are best just pulled out at the joint. Pink “pipings,” for instance, can be pulled off in this way. The only other thing to do in “making” a cutting is to take off a few of the lower leaves from the stem before inserting it in the sand. The reason for this is that the leaf, being rather more succulent than the stem, is more liable to damp off, and it is inadvisable for leaves to be below the soil level.

In a few cases, such as, for instance, in the case of Willows and Clematis, roots appear to form more readily from the parts of the stem between joints, and cuts are usually made there in preference to just below the joints. These are called *internodal* cuttings.

Leaf Cuttings.—In some plants it is more convenient to make cuttings from leaves. Begonia Rex is one of the best-known examples of this. This is the Begonia which has the large ornamental leaves of variegated colouring. If a leaf is taken and notched on the underneath side in several places, and then laid over moist sand in pans, and pegged down where the notches are, so that it comes in actual contact with the sand, roots will quickly form. Each piece of leaf with the roots so formed can then be separated, and potted up as a new plant. Some leaves will form new plants at the edge. For instance, a large leaf of Bryophyllum laid on damp sandy soil, as in the case of the Begonia, and kept moist, will produce new plants all round the outer edge.

Ringling.—A common trouble with the housewife who grows indoor foliage plants, is that some of them tend to become tall and “leggy” and unsuitable for table decorations. The Aralia is a common example of this. After a number of years it usually presents a long-legged appearance, which is anything but beautiful. Cutting the plant down to near the soil-level would spoil its appearance, and it is better to induce the plant to make roots, higher on the stem and to repot the top with the new roots.

To do this, the operation of ringling is practised. With a sharp knife

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a ring of the outer bark is removed from the main stem, at the part where the new roots are wanted, that is, fairly near the green top. After this, moist soil must be packed and held round this ringed part until the roots have formed. The easiest way to do this is to split a flower pot in two halves vertically, and replace the halves round the stem of the plant, filling the pot with soil and binding it into position on the stem. A few canes pushed into the soil of the old pot will hold the split pot more securely. After the roots have formed, the lower portion below the new roots is cut away, and the top re-potted. If a split flower pot is not used, moss can be bound round the ring and kept moist until the roots form. Ringing is often adopted with other plants, such as Tree Carnations, *Dracæna*, etc.

Layering.—Layering is a form of plant increase which Nature frequently practises. The Bramble, for instance, sends out long canes, which gradually bend their tips down towards the soil; as the tips touch moist soil they send out roots, and a fresh plant is formed. The gardener practises the same operation in order to increase such plants as Loganberries, and a good many of the ornamental shrubs. He also practises it with some of the border plants as, for instance, Carnations. Strawberries are increased in the same way.

The operation of layering is most commonly practised with Carnations in the amateur's garden and will be described in detail. Other forms of layering are done on exactly the same principle. The first essential for layering Carnations is that the soil round the plant should be vacant for a space of, say, 6–12 in. all round, and it should be of light open texture. The best thing to do is to surround the plant with a 2 or 3 in. layer of fresh soil (which should include wood ashes and mortar rubble) before the layering is begun.

The next essential is that the plants shall be well provided with side growths fit for layering, that is, side growths that are not carrying flowers.

The actual operation of layering is rather similar to taking cuttings, except that each cutting is left partly attached to a parent plant until the roots have formed. It is therefore not so likely to succumb to drought, or other troubles, since it has the sustenance of the parent plant on which to fall back.

Each of the side growths to be layered is stripped of two or three pairs of leaves from a part of the stem, say, about 3 or 4 in. from the top. After this, a slanting cut is made about two-thirds of the way through the stem, the cut being made upwards. This part of the stem is then bent down into the prepared soil, so that the cut is open, and a peg of some sort is pushed in to hold the plant firmly in position. The soil is then pressed well round it, and the operation is complete.

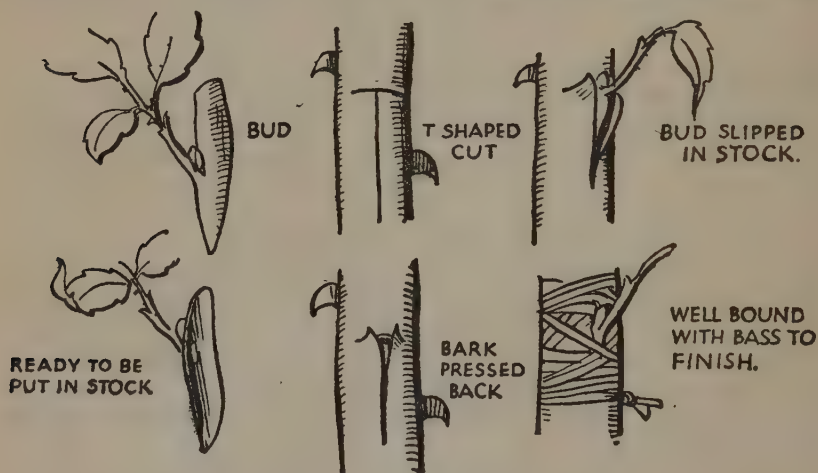
At the end of about three weeks roots should have formed at the

place where the stem was cut. It is not, however, advisable to move the layer for another few weeks, though it can be severed from the parent plant. It is best to leave it where it is until about eight weeks after layering and then to move the new plant to permanent quarters.

Layering of Carnations is usually done about July and the plants are then ready for autumn planting in fresh borders.

In the case of hard-wooded shrubs, layering is more satisfactory than taking cuttings, but it frequently takes some considerable time for roots to form. In the case of Rhododendrons it may not be possible to move the root layer for about twelve months.

Budding.—Budding is a form of plant propagation practised in order to save time. If a single bud of a new variety of rose is grafted, for



BUDDING A ROSE

Budding can be undertaken by the amateur quite successfully if these simple instructions are followed

instance, on to a strong healthy brier long strong shoots of the new variety will soon develop. Budding is also practised because some of the best varieties of roses or fruits will not grow strongly on their own roots. For whatever reason budding is done the operation is the same.

The tool needed is a budding knife with a very sharp cutting blade and blunt pointed handle. Budding can only be practised at a time of year when the sap is active, so that the bark of the stem will separate easily from the wood. For budding, a healthy bud on wood of the current year's growth must also be used. The operation is quite simple.

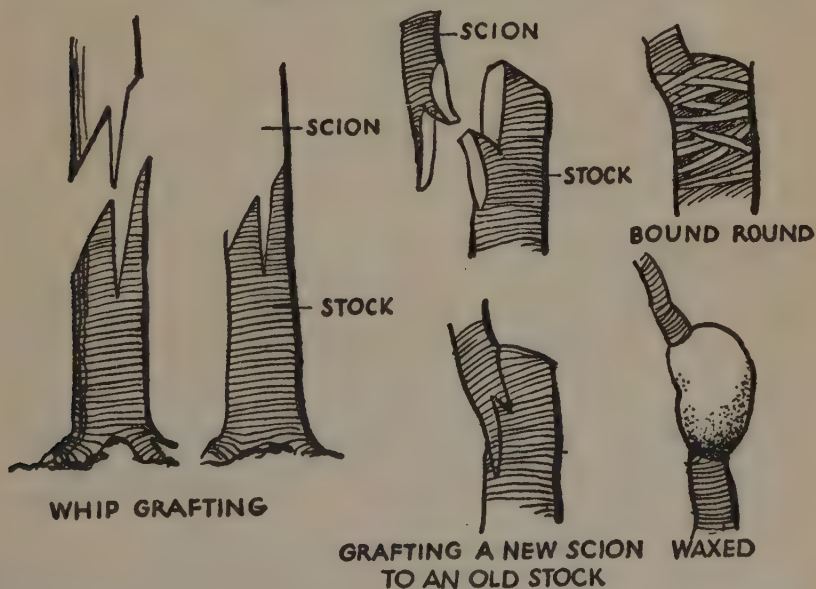
A T-shaped cut is made in the bark of the stock (that is the brier or tree on which a new variety is to be grafted). The cut is opened with

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the blunt handle of the budding knife, the bark being eased away from the wood and turned back to allow for the insertion of the bud. For this the blunt-pointed handle of the knife is used.

The bud to be inserted must be prepared only immediately beforehand, otherwise the bud begins to dry, and will not unite with the stock. Preparation of the bud consists in making a semi-circular cut in the stem behind the bud so that the bud is cut out with a portion of bark and wood attached. (The bud is a dormant leaf bud, not a flower bud.) From the back of this the piece of wood is removed, leaving the bud only with the bark. This must be done rather carefully otherwise the bud comes out with the wood.

Before it becomes dry, the piece of bark with the bud is slipped into the T-shaped opening, and the cut edges pressed back in position so that



Grafting is undertaken in the spring and is a useful means of producing good crops on an inferior variety

the bud and bark attached are held closely against the inner wood of the stock. Raffia is then bound round to keep them firmly in position. The raffia should pass over all the broken edges of the bark, but should leave the bud exposed.

In a very short time, say about three or four weeks, it will be possible to tell whether the budding is successful. Either the bud will shrivel and die, or it will plump up, and it will be quite evident that it has united

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with the stock. When this happens the raffia is cut, so that sap is not impeded in reaching the bud.

Should a shapely standard be desired, it is usual to bud the stock in two or three places, as less training is subsequently necessary to produce a good bud.

Grafting.—Grafting is an operation similar to budding, with the exception of the fact that instead of a single dormant bud, a whole shoot of one plant is grafted on to the stock. Several forms of grafting are practised. All, however, are on the same principle. The scion must be joined with the stock in such a way that the cambium layers of each meet together. The cambium layer is the layer between the bark and the pith of a tree.

If the stock and scion are of the same size a simple slanting cut can be made and the two put together and held in position with grafting wax and raffia. If there is considerable difference in size, the smaller scion is inserted at the side of the stock so that the cambium layers meet. Cuts in all cases must be freshly made immediately before the union, otherwise the grafting will be unsuccessful.

The different names given to the kinds of grafting, merely refer to the shape of cut which is made in the scion. **CLEFT GRAFTING** is when a cleft or **V**-shaped cut is made in the stock and the scion is cut to a wedge shape, so that it fits in the cleft. **SADDLE GRAFTING** is when the shape of the cut in the scion is like an inverted **W** so that the scion sits over the stock. **RIND GRAFTING** is when two or three cuttings are inserted on the outer edge or rind of the tree.

Inarching.—Inarching is a somewhat similar practice to grafting, sometimes done in the case of vines. The stems from two vines are brought close together and a piece cut from the bark of each. The two surfaces are pressed together and the join is sealed over as in grafting. When the union is complete the top of the unwanted vine is cut off, and the other vine separated below the join so that the top of the wanted vine is left on the inferior stock.

Grafting Wax.—Special grafting wax is sold in small quantities for use by amateur gardeners. It is better to buy this than to mix a home-made supply. It is a soft putty-like substance which, when pressed round the graft, holds it firmly and prevents the access of rain, or keen-drying winds, to the cut-portions of the tree or shrub.

AFTER BUDDING OR GRAFTING only the newly grafted buds are allowed to grow on the plant in subsequent seasons. The tops of budded plants are cut back in early spring to just beyond the new bud, and any growths developing on the old wood below the bud or graft are rubbed off at once.

CHAPTER XVI

SOIL AND ITS TREATMENT—USE OF FERTILIZER.

CARE OF THE SOIL AND USE OF FERTILIZERS

THE first thing to do in the new garden is to decide what condition the soil is in, and what treatment it needs. The new garden which has been left by the builder is probably just a waste heap. It may be that he has left dumps of sticky clay, sub-soil, gravel, or other material excavated during the laying of the foundations. It is quite useless to spread this over the surface of the top spit to make up the borders. Unfortunately that is precisely what builders are in the habit of doing. On many housing estates an attempt is made to plan and make the garden ready for the incoming tenant. Frequently, on investigation, it is found that the laying out of the garden has meant the spreading of excavated sub-soil over the existing soil, which effectively ruins the gardening possibilities of the site.

As soon as the plan has been drawn up, therefore, the condition of the soil should be ascertained. Dig a hole, and notice the different colours of the soil as you dig out each spade depth. The most fertile soil is usually the darkest soil, coloured by decaying vegetable or animal matter.

If you find that sub-soil has been spread over the top as already suggested, you will have to reverse the positions of the top and under spits of soil as you dig. If the dark fertile soil is on the surface, digging will consist in turning over this top spit, and breaking up the lower spit of soil.

The relative merits of the dark soil and the clay, chalk, or gravel that lies below it, must of course be kept in mind if excavations are being made for sunk gardens or rock gardens. In such cases the best plan is to move the fertile spit of soil to one side while the necessary levelling and excavating are being done and to replace it later.

Methods of digging have already been described in Chapter XV, but it is worth while here to run over the various operations which have to be done *each year* in order to keep soil in good condition.

WHAT IS SOIL?

Soil is not dead matter. It is full of living bacteria which need air and moisture in order to perform their duties. Air and moisture

COMPLETE GUIDE TO HOME GARDENS

in the soil depend as much on its texture as on any chemical additions that can be made, and the improvement of soil texture is the first step in cultivation.

Soils are composed of varying proportions of sand, clay, chalk and gravel, together with humus, or decaying animal and vegetable matter. According to which of these ingredients predominates, soils are called by different names.

Sand consists of grains of quartz or other rocks, mainly silica, together with mineral impurities, some of which are possibly plant foods. Sandy soils are *light* soils.

Clay consists of the same material but ground to a finer powder and held together with a sticky material which is actually a compound of silica, alumina, and water. *Stiff*, or *heavy* soil, is soil which contains a very large proportion of clay.

Peat is a soil composed almost entirely of old vegetable matter. It is usually sour, that is to say it is deficient in lime, but when dressed with lime is often extremely fertile. Certain plants have adapted themselves to the conditions of peat soil, and will not grow in ordinary fertile garden soil where lime is present. The peat which is recommended for use in the cultivation of Orchids, and many other greenhouse plants, is the surface soil of heathland, and usually somewhat greyish in colour; it is not the peat which is dug out of marshy districts in Ireland for fuel.

Marl.—Marl is a soil that contains carbonate of lime. Clayey marls are extremely fertile.

Humus is a name given to any decaying vegetable or animal matter in the soil, such as the decaying roots and leaves of former crops or stable manure.

Soil is usually referred to by gardeners as either light or heavy. Light soil is loose and sandy. A spade will go into it quite easily, and as each spadeful is lifted it will be found that the work is less arduous than on heavy soil. Light soil is not usually so fertile as heavy soil. Heavy soil is mainly clay, that is to say, it is composed of finer particles than light sandy soil. These fine particles adhere together, and hold more moisture than do the coarser particles. Heavy soil is much more tiring to the gardener. This is a case of "what you gain on the swings you lose on the roundabouts," for what you may gain in easy management, you may easily lose in the lack of fertility of light soil.

All soil, heavy or light, must be brought into good condition by some improvement of the natural texture. This improvement is brought about in Nature's domain by the falling of leaves, and the decay of plant tops, both of which add humus to the surface soil. In the garden, humus can be added in much the same way, that is by working into the soil all the available dead plant tops and decayed leaves, and digging

CARE OF THE SOIL AND USE OF FERTILIZERS

in stable manure. The effect of adding humus in this way is to make light soil moister, and to make heavy soil lighter in texture and more porous, so that air penetrates to the plant roots. The treatment of both kinds of soil is therefore somewhat similar, the only difference being that the manure added to heavy soil should preferably be of a coarse, strawy nature, whereas the manure added to light soil should be heavier. Cow and pig manure are ideal for sandy gardens.

Summer Cultivation.—Digging of all kinds is done mainly in the winter months. The summer cultivation of soil consists of keeping the top spit in a light friable condition. For this a hoe is used. Many novices think that the use of the hoe is chiefly to destroy weeds, but this is only half of the work that it is intended to do. It has been found by frequent experiments that soil which is kept hoed on the surface, so that it never cakes and cracks, is several degrees warmer in winter, and considerably moister in summer than unhoed soil. Hoeing therefore takes the place of watering, and is actually far better for the plants. The artificial application of water, particularly water from a cold tap, is not desirable at any season if it can be avoided.

Soil Fertility.—The fertility of any soil depends not only on the amount of plant food in the soil but on the plant food which is available to the roots. Plant food can only be taken up by roots in the form of a solution, and insoluble plant food in the soil is, therefore, useless. That is why the vendors of fertilizers are required to state the amount of soluble food of each kind there is in their product.

The chief plant foods are phosphates, nitrogen and potash, and these three are often referred to as the "Golden Tripod." They are essential for every kind of plant, and each has a special function. It is worth while for the amateur gardener to make himself acquainted with the effect of each of these plant foods on vegetable life, because, once understood, the vexed question of plant feeding becomes both more interesting and more profitable.

The other essential plant foods are present in sufficient quantities in most soils. They include water, sulphates, oxygen, iron, magnesia, soda, chlorides, and silica.

Nitrogen.—Of the three plant foods Nitrogen is the leaf-forming food. It makes a plant larger, and encourages quick development of leaves and stems. Applied *after the flowers form* it makes the individual flowers larger and finer, but it has to be used with care in the flower gardens. If it is applied too heavily to flowers of any kind, the effect is to make the plant larger and leafier, and possibly to delay flowering, which may mean that the flowers do not appear until after the frosts arrive.

Phosphates.—Phosphates are the plant foods which produce flowers

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and fruit. They can therefore be applied freely in the flower garden and the orchard, and they are also useful in parts of the vegetable garden, such as, for instance, on Cauliflowers, Peas and Beans. But they are undesirable amongst such crops as Cabbages, which would be encouraged by an excess of phosphates to go early to seed.

Potash.—The third plant food, potash, is a kind of tonic. It is essential to the health of the plant, and assists in fighting diseases. In fact, it is often better to apply potash to plants suffering from fungus troubles than to attempt to deal with them by the application of fungicides.

These three plant foods are, however, useless in most cases without the presence of lime in the soil.

Lime is essential to all soils, except where a certain group of plants are grown called Calcifuges, or lime-haters, of which the commonest representative is the Rhododendron. The amount of lime present in the soil should be at least one part in two hundred. Elaborate tests are available for estimating the amount of lime in any garden soil, but a simple method which the novice can undertake by himself is to take samples of soil from different parts of the garden. Mix them together, and put a little in a tumbler. Add to this about a tablespoonful of hydrochloric acid or muriatic acid. If the liquid bubbles freely, the soil contains a sufficient amount of lime for garden purposes. If it does not, a more or less liberal dressing of lime in some form is required.

The best time to apply lime is in the winter and in the form of slaked lime, which is a fine powder. It is best to spread it evenly over the surface of the soil, where it can be left to be washed in by rains. It is not advisable to use lime amongst plants during the growing season, or allow it to lie on plant foliage. For this reason, it is better to use a fine powder, which can be dusted on to the soil surface, without harming the leaves. Also it is best to apply it during the winter months. Whenever a vacant plot has been dug deeply, lime should be applied at once over surface.

Chalk is a form of lime. It is quite as effective as a fertilizer, and useful on light sandy soils, but it does not break up heavy soil in the way that slaked lime does, nor does it assist in destroying pests in the soil. It can be applied to light soil at the rate of 2-3 oz. per square yard, but it should be broken up fairly small, and mixed into the top spit of soil.

Gas Lime.—Gas Lime is cheap and useful, but it contains a proportion of poisonous compounds of sulphur, and plants must not, therefore, be grown in the soil for some months after its application. It is used sometimes as an insecticide, but a good commercial soil fumigant would probably be better. From 2-4 oz. per square yard is sufficient for any purpose.

COMMON FERTILIZERS

It may be remarked at the outset that the novice is well advised to rely on the many good general fertilizers, ready mixed for easy application, and sold in small quantities with full instructions as to use. It is not easy to mix chemicals by hand with the accuracy of a machine, and some of the chemicals used in the proprietary compounds are not readily available to the amateur gardener. In the small garden, therefore, I should always advise the use of ready-mixed fertilizers, which are cleaner to handle than the home-mixed supplies. Some gardeners are, however, able to obtain specially cheap supplies of different materials, for which a use can be found in the home garden, and it is worth while to run over the commonest of these and give an estimate of their value.

Ashes from the bonfire contain a proportion of potash, and for this reason are useful. They are, however, not half so valuable as unburnt vegetables, and dead plant tops, weeds, leaves and so on. Wherever possible, such matter should be stacked in a heap until it can be dug into the soil, rather than consigned to the bonfire, except in the case of hard woody stems which would not rot quickly, and also any leaves or plant tops which might possibly be diseased, and which would cause trouble later by the spread of disease spores.

Basic Slag is a phosphatic fertilizer, slow in action. Its value depends on the fineness of its texture. It is particularly valuable for fruits, roses and flowering shrubs, and can be applied in winter at the rate of 2-4 oz. per square yard. It contains a proportion of lime.

Bone-meal.—Bone-meal is a slow-acting fertilizer. It is available in several degrees of fineness, the coarser kinds being even slower in action than that which is ground to a fine powder. It is specially useful in preparing the soil for roses, shrubs, and other plants which will not be lifted periodically, and also for soil in ornamental vases, tubs, window-boxes and so on. In the beds of the greenhouses, where vines are to be grown, and in the shady parts of the garden, bone-meal is a better manure to be used than decayed vegetation or stable manure. It is phosphatic, and encourages fruitfulness rather than leaf development, and reduces the tendency of the shady garden to produce fine foliage but few flowers.

Dried Blood.—This is the blood from the slaughter-house, dried and sold in crystalline form. It is too expensive for general use in the garden, but is frequently used by exhibition growers on Sweet Peas and other flowers, because it intensifies the colour of the blooms.

Fish Meal.—Waste fish is dried and ground and sold as fertilizer for the garden. It is a useful complete fertilizer and particularly good

on light soil. It has been found specially useful as a fertilizer for raspberries.

Kainit contains sulphate of potash, mixed with a good deal of common salt, Epsom salts, and chloride of magnesia. It is the cheapest potash manure to use, and is best applied during the winter so that the impurities are washed from the soil before the growing season. It is specially useful for Asparagus and Beet.

Nitrate of Soda is a quick-acting fertilizer, extremely soluble, and therefore only to be applied during the growing season. It is entirely nitrogenous in character and is used chiefly on green vegetable crops, and on plants where it is desirable to increase the size of the leaves. About an ounce dissolved in a gallon of water makes a useful liquid fertilizer for application when the soil is moist.

Nitro Chalk.—Nitro chalk is the most up-to-date fertilizer for use amongst growing crops. It takes the place of nitrate of soda for this purpose, but it contains a proportion of lime which makes it specially valuable. It is said to be specially effective where such a disease as “finger-and-toe” is common.

Phosphate of Potash is a soluble form of fertilizer, excellent for use as a liquid manure in the greenhouse.

Seaweed.—In some districts seaweed is available in large quantities at cheap rates. This is quite useful in the soil and can be dug in, in liberal quantities, without harm. It is particularly valuable on potato crops.

Soot.—The food value of soot is very little. It contains just a minute quantity of nitrogen, but its chief value in the garden is as an insecticide. It is also useful because it darkens the colour of the soil and so induces solar heat. Soot from the house fires should be stored dry for a short time before use. It is particularly valuable as a lawn dressing, in fact it is remarkable how quickly a vivid green spreads over the lawn after a light dressing of soot.

Sulphate of Ammonia contains about 20 per cent. of nitrogen. This is a more desirable nitrogenous fertilizer for general use in the garden than nitrate of soda, as it can be given in a single application in spring. It is retained by the soil for use during the summer instead of being quickly washed away, as in the case of nitrate of soda. Sulphate of ammonia damages foliage and is, therefore, best applied before the growing season begins, except on lawns, where its effect, in small doses, is to discourage the broad-leaved weeds and to encourage the finer grasses on which the dusting of ammonia does not adhere.

Sulphate of Potash is a purer form of kainit, and better for some garden purposes, such as for use in potting soil and on the strawberry beds.

CARE OF THE SOIL AND USE OF FERTILIZERS

Superphosphate of Lime is a soluble form of phosphatic manure used in springtime, as it quickly becomes available for plant food. It is used at the rate of about 3 oz. per square yard.

The Compost Pit.—It is undoubtedly true that from any ordinary small household where the garden is just an average one of say ten to twenty rods, sufficient humus can be obtained from a compost pit to keep the soil texture in good condition. The usual advice given—which is very sound—is to dig a deep pit in an out-of-the-way corner of the garden, and put into it from time to time all the household refuse such as tea leaves, vegetable parings, bones, etc., and occasionally to scatter a few handfuls of soil and a little lime among the refuse.

Each winter the contents of the pit will be taken out and dug into the garden. If such a pit is arranged, it is better to brick the sides and bottom to prevent loss of valuable ammonia through seepage.

It must be admitted, however, that the average small garden owner does not want a rubbish dump in his garden. He fears that it may become a breeding-place for insect pests (though the lime would prevent this), and he is also unwilling to give up a portion of his garden, even a very small part, to an unsightly feature.

The popular incinerators sold by horticultural sundriesmen form a ready solution to his problem, and although he is definitely losing some of the manurial value of the garden refuse, he may prefer this to the presence of the alternative compost pit. Fortunately, some of the modern artificial fertilizers which can be purchased in small quantities contain humus, as well as chemical foods, and if the slight extra expense is no object, there is no reason why these complete fertilizers should not take the place of the so-frequently-recommended compost pit.

Mixing Artificials.—Care should be taken in mixing artificial fertilizers. Certain chemicals must not be mixed with others before application. The amateur who wishes to mix a complete fertilizer for general use in the garden can do so by obtaining 7 lb. sulphate of ammonia, 7 lb. sulphate of potash and 21 lb. superphosphate of lime. This mixture can be kept in storage for use in spring, or at any time during the growing season, and can be dusted on the soil at the rate of about two to four ounces per square yard.

For the convenience of amateur gardeners the following list has been prepared of useful fertilizers and quantities that can be used on some of the commonest of garden crops.

Fuller details of application will in many cases be found in other chapters.

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	<i>Fertilizer</i>	<i>Quantity per sq. yd.</i>	<i>Time of application</i>
ASPARAGUS.....	{ Superphosphate with Kainit	{ 2½ oz. 6 oz.	{ February
CABBAGE, LETTUCE and other green crops.	{ Nitrate of Soda	{ ½ oz.	{ Summer, at intervals of 3-5 weeks
CARNATIONS	{ Superphosphate with Sulphate of ammonia	{ 4 oz. 2 oz.	{ Spring
CHRYSANTHEMUMS (also roses, toma- toes, and carna- tions, as they come into flower).	{ Nitrate of Potash 1 oz. Phosphate of Potash 1 oz. applied in a gallon of water as a liquid stimulant.	{ ½ pt. to each plant.	
LAWNS	{ Basic Slag and Kainit followed by Superphosphate of lime and Sulphate of ammonia	{ 1 oz. 1 oz. 1 oz. ½ oz.	{ November March
ONIONS	{ Kainit Superphosphate with Nitrate of Soda during the growing season.	{ 1¼ oz. 2 oz.	{ Spring
POTATOES	{ Superphosphate Sulphate of Ammonia and Kainit	{ 2 oz. 1 oz. 1 oz.	{ Spring
ROSES	{ Superphosphate with Sulphate of Ammonia	{ 3 oz. 1 oz.	{ Spring
STRAWBERRIES	{ Superphosphate with Sulphate of Ammonia	{ 3 oz. 1 oz.	{ Spring

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	<i>Fertilizer</i>	<i>Quantity per sq. yd.</i>	<i>Time of application</i>
THE MIXED BORDER	Basic Slag	2-3 oz.	} November
	with		
	Sulphate of Potash	$\frac{1}{2}$ oz.	} March
	followed by		
	Superphosphate	1 oz.	} March
	and		
	Sulphate of Ammonia	$\frac{1}{2}$ oz.	
TURNIPS	Basic Slag	2 oz.	Winter
VINES	Superphosphate	3 oz.	} Spring
	Sulphate of Ammonia	1 oz.	
	Sulphate of Potash	1 oz.	

CHAPTER XVII

COMMON INSECT PESTS AND DISEASES—BENEFICIAL INSECTS —RECIPES FOR INSECTICIDES, FUNGICIDES, ETC.

TREATMENT OF PESTS AND DISEASES

PRACTICALLY every flower, fruit and vegetable under cultivation has its own special pest or disease. In many cases they are beset by numerous enemies, and it is almost a wonder they survive at all. Some pests can be dealt with by spraying, others only by patient hand-picking, or scrubbing, as in the case of Scale on indoor fruit trees. Prevention is better than any attempt to cure, and good cultivation is half the battle. If plants are strong, and healthy, and well cared for, they will resist disease and grow fairly well even when attacked by pests. Nurserymen and seedsmen nowadays concentrate to a certain extent on producing disease-free or "immune" varieties, but weather conditions take a big hand in the game, and diseases hitherto scarce in this country may make their very unwelcome appearance during exceptionally hot or wet periods. An example of this is the Rust appearing on Onions and Leeks and also on Antirrhinums and Chrysanthemums, which has recently proved specially troublesome. Then there are invading pests such as the dreaded Colorado Beetle which attacks potato crops, and which has made one or two attempts to invade these islands. This has been somewhat "in the news" lately, and it is to be hoped that growers will keep their eyes open and report its presence so that it can be fought back successfully.

There are hundreds of pests and diseases, but only particulars and treatment for the most common can be given here.

American Blight. (*See under WOOLLY APHIS.*)

Ants.—At the first sign of serious trouble from these active little insects their nest should be traced. This can easily be done by putting sugar down, and tracing the insects as they carry it away to feed their young. After a hole is made about 1 ft. deep, in the nest, an ounce of carbon bisulphide should be poured into it, and the hole stopped up immediately. The ants will be destroyed by the fumes, but the eggs and larva are not affected, so a further dose must be given about a fortnight later to kill off any that hatch out in the meantime.

Where there are trees, a thick white chalk-line round the trunk will

TREATMENT OF PESTS AND DISEASES

prevent the ants from getting into the fruit and flowers, as they cannot get a foothold on the chalk.

Apple and Pear Scab.—One of the worst fruit diseases. It first appears as dark spots on the leaves, and then spreads to the fruit, appearing as cracked scabby spots on the skin. Burn all fallen leaves and twigs from affected trees, and spray with Bordeaux mixture immediately the fruit has set, and again about a month later.



Apple canker is a very destructive disease. Some varieties are more susceptible than others. Badly attacked trees should be destroyed. Lime-sulphur spray is a remedy to be applied in winter

Apple Canker.—This disease enters the bark of the trees through wounds, often through those made by the Woolly Aphis, or untreated pruning wounds. A callous forms round the wound, which spreads and often entirely encircles a branch, which, of course, then dies. Certain varieties of Apples are more subject to this disease than others and trees in heavy soil, or low-lying districts, are more subject to it. All affected parts should be cut out and burned, and a winter lime-sulphur spray used.

Bean Aphis.—Sometimes called Black-fly or Black Dolphin, first attacks the terminal shoots, but if not removed spreads all over the plant, covering it with a dark sticky mass. It sucks the sap from the plant and entirely ruins the crop. Pick off and burn the tips of plants affected. Spray with Quassia, or dust the plants with soot or lime.

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Big Bud.—The Black Currant's own pest. It is a tiny insect that buries itself in the bud, causing it to swell. Badly affected trees should be dug up and burned immediately, others can be sprayed in May and June with lime-sulphur solution. The diseased buds, which are rounder and fatter than most buds, can be picked off by hand, if not too numerous, and immediately burnt.

Brown Rot of Fruit.—Attacks Apples, Plums, Cherries, Peaches, and Tomatoes. Like scab, it first appears as dark patches on the leaves. Sometimes the blossoms turn brown, and the spores spread to the fruit, causing brown patches on the skin. Do not attempt to store affected fruit. Spray the trees with Bordeaux mixture when the fruit sets, or use a winter spray of copper sulphate. Remove and burn any mummified fruits found on the tree in the winter, dead leaves and twigs. Also burn all prunings.

Bulb Mite.—This pest affects any kind of bulb, but is so small that its presence is only apparent when the damage is done. The foliage turns yellow, and small red rust appears on scales of the bulb. To prevent attacks of this pest, bulbs should be washed in a potassium sulphide solution. Bulbs attacked should be destroyed at once as there is no known cure.

Cabbage Butterflies.—This caterpillar when very small can be destroyed with a spray of hellebore wash and soft soap. Hand picking is as effective as any treatment, and a search for the eggs on the leaves is worth while.

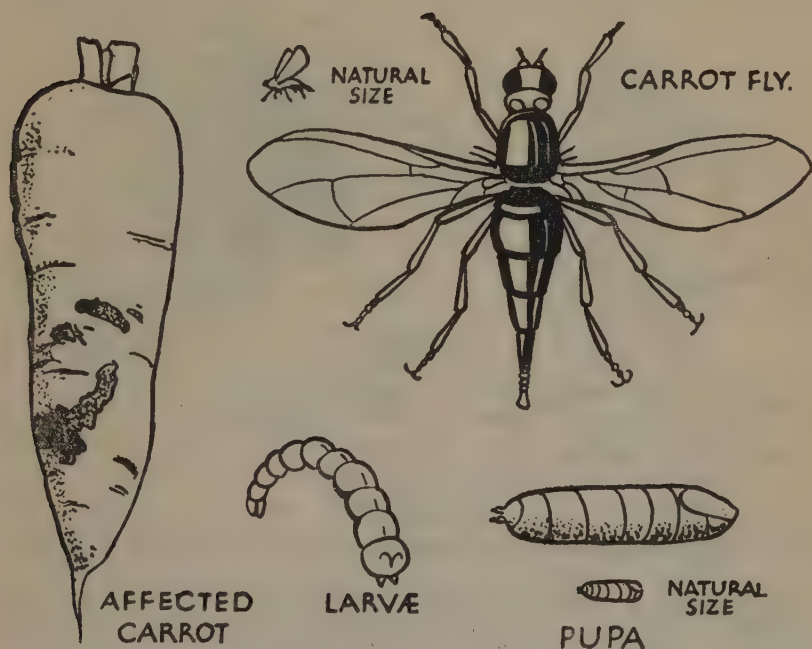
Cabbage Root Fly.—A soil fumigant should be dug in before cabbages are planted if this pest has previously been troublesome. Paraffin mixed with sand, spread round the plants, will keep off a large number of flies who normally would lay their eggs near to the root of the cabbage. The maggots, as they hatch, enter the roots in search of food, and cause the sick appearance of the plants. Any cabbages attacked must be burnt at once, as there is no cure for the trouble when the plants have turned a sickly yellow. Fumigant should then be applied to the ground. This attacks all members of the cabbage family. In districts where it is specially troublesome, it pays to buy the special felt collars supplied by nurserymen to keep the flies away from the roots. Watering the soil with a teaspoonful of strong ammonia in a gallon of water is often effective.

Capsid Bug.—This insect attacks apple trees, and currants. The leaves of the apples begin to show dark brown spots in April, and the young shoots are thus retarded in growth. As soon as the fruits have set, they are covered with red or brown pimples. As the apples increase in size so the damage spreads, until the fruit drops off the tree. The insect itself is like a larger green fly, and very active. Strong nicotine

TREATMENT OF PESTS AND DISEASES

wash should be used in April, and early May. A thick lime-wash applied just as the leaf buds burst, prevents the eggs hatching.

Carrot Aphis.—This pest becomes apparent when the foliage turns yellow and the crowns become discoloured. The plants may be sprayed with tobacco juice or paraffin emulsion, spraying well on to the crowns of the roots.



Paraffin mixed with sand and dusted between the rows of young carrots will keep a check on the carrot fly

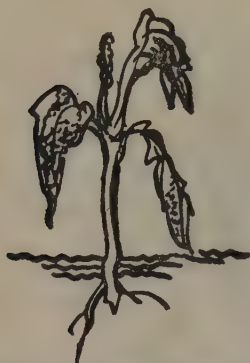
Celery Fly.—The leaves of the celery are attacked, causing them to blister and decay. Use a strong soil fumigant before putting the plants into the ground. Spray the leaves with quassia or paraffin emulsion, to keep the fly away, otherwise it appears in June, July and August. Dusting the plants with soot and lime also discourages the flies from laying their eggs. Burn all affected foliage, or pinch the "blisters" between the thumb and fingers to destroy the maggots that are developing in them.

Club Root, or Finger-and-toe.—This disease chiefly affects members of the cabbage family, and turnips. As there is no cure when the disease once affects plants, preventive methods must be taken.

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Give suspected ground a good dressing of lime, at least 4 oz. per sq. yd. All diseased plants should be burned immediately, and no members of the family planted in the same plot the following season, to give the lime an opportunity of thoroughly cleaning the ground.

Cockchafers.—There are several varieties of this destructive and unpleasant pest. The *Common Cockchafer* usually attacks Raspberries



YOUNG PLANT WITH
ROOTS DESTROYED
BY COCKCHAFER
LARVÆ



FEMALE COCKCHAFER



LARVÆ.

Ground infested with cockchafer grubs should be treated with a soil fumigant in autumn

and Strawberries, the grubs feeding on the roots of plants, and the beetles on the foliage. The *Summer Cockchafer* mostly attacks vegetables. The *Garden Cockchafer* confines its efforts to Turnips, Peas and Beans, and the *Rose Cockchafer*, which is the beauty of the family, attacks practically all the plants affected by the others in the family, but especially Roses.

Beetles may be shaken off rose or fruit trees on to tarred boards, or removed by hand and destroyed. Do not shake too vigorously, as the beetles are inclined to fly away if awakened from their daytime sleep. Arsenate of lead may be used as a spray, but as this is poison it should only be used in the early stages of fruit development. A fumigant dug into the ground surrounding the trees destroys the larvæ.

Codling Moth.—This attacks Apples, the maggots creeping into the centre of the fruit, usually through the eye. It leaves the fruit through another channel and shelters in the bark. If the apples fall, the maggots shelter in the soil, therefore a soil fumigant will destroy some. Grease-

TREATMENT OF PESTS AND DISEASES

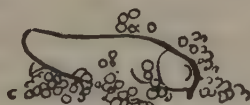
banding, however, provides a home for the female moths, which are wingless, and these can be removed and destroyed from time to time. Spray with lead arsenate immediately the blossom has fallen. Winter washing destroys those of the pests that hibernate in the bark.

Colorado Beetle.—This much dreaded pest has appeared on potatoes in several parts of the country, but is not at present generally troublesome. The full-grown beetle has orange and black striped wings, the grub is of an orange colour, and the eggs are also orange. The beetle when full



CUCKOO SPIT
ROUND ROSE
BUDS.

ADULT
FROG HOPPER
(ENLARGED)



NYMPH



ADULT, WITH
OPEN WINGS

The secret of ridding plants of cuckoo spit is to syringe them with clean water to expose the insects, and then with an insecticide

grown is about $\frac{1}{2}$ in. long from head to tail. It spends the winter deeply buried in the soil, and in late spring works its way to the surface. This is a notifiable pest, and anything resembling the Colorado Beetle, found on potato plants, should be immediately sent (in a closed tin box) to the Ministry of Agriculture, 10, Whitehall Place, London, for inspection.

Cuckoo-spit insect, sometimes known as frog hopper. Hand killing, although unpleasant, is the most effective way of dealing with this little green larva. Spraying may, however, be resorted to if the attack is a bad one, and quassia or nicotine soap is the spray to use.

“Damping-off” Disease.—Young seedlings are the chief sufferers from this disease, and it is encouraged by over-watering and lack of sufficient ventilation. Pull up and burn all affected plants immediately the disease shows itself, and dust the rest with flowers of sulphur. A preventive is to use formaldehyde as a soil drench.

Earwigs.—This is a late season pest, and affects dahlias and late roses more than any other plants. The old-fashioned method of inverting flower-pots on the heads of the stakes to act as traps has still to be improved upon. The pots should be filled with hay or straw or even tissue paper in which the earwigs can make their nests. A poison bait may be used where there are no children or domestic animals. Sodium fluoride mixed with wheat bran and molasses and spread on paper is usually effective.

Gooseberry Mildew, American.—As this disease affects shoots, leaves and fruit, it is a most difficult one with which to deal successfully. It first appears white between April and June, and brown from June onwards. It is especially prevalent in warm, moist weather and in damp, low-lying positions. The bushes should be well sprayed with lime-sulphur the first week in April, and two further applications given at monthly intervals. All diseased tips of shoots should be removed and burned. A soda and soap solution applied at ten-day intervals after the fruit has set, and a strong caustic soda spray in February will also keep the disease in check.

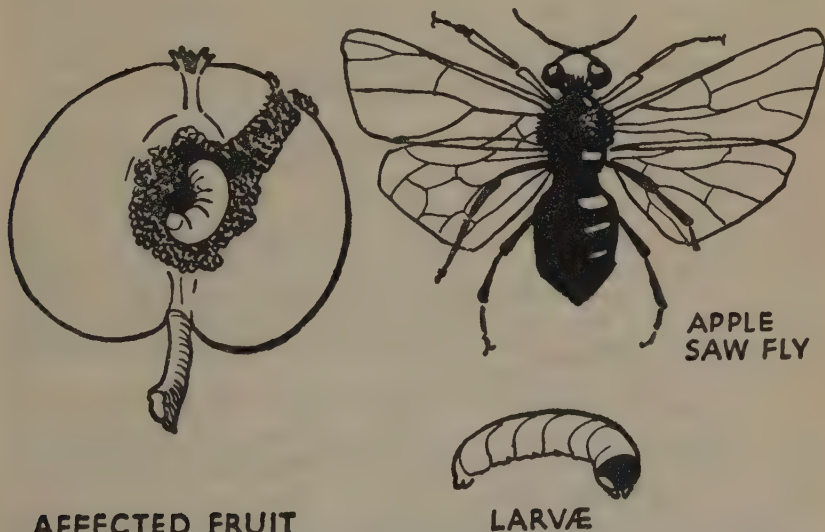
Green-fly and Black-fly.—Officially known as aphides. The green-fly mostly attacks flowers such as roses, flowering shrubs, and carnations, but the black-fly affects beans, nasturtiums, and cherries. Ladybirds deal with a large number of the green-fly, but nicotine, paraffin emulsion or quassia sprays may be used. Tar oil and caustic soda sprays in the winter will rid fruit trees of this pest.

Gummosis or Gumming Disease.—Attacks cherry, plum, peach and almond trees. The disease appears as small drops of colourless gum oozing from the branches and trunk. To prevent this, great care should be taken when pruning to cover all wounds with Stockholm tar or white lead paint. Diseased branches should be cut off and burned immediately the disease appears. The spores may be washed down the trunk by the rain, so by moving the top layer of soil round the tree and replacing it with fresh soil containing some quicklime, the gumming may be checked.

Lawn Pests.—*Moss.* This should be raked off, and a good dressing of lawn manure given. A dressing of lime will sometimes be effective. *Fairy Rings.* These are caused by a fungi. The ring slowly increases and destroys all the grass covered by the circle. The fungi is a parasite and lives on the roots of the grass. The problem of getting rid of this disfigure-

TREATMENT OF PESTS AND DISEASES

ment should be attacked in the autumn by applying dressings of sulphate of iron, followed by lime. After such applications it is important that a lawn manure be given to encourage the grass to fight the fungi and recover from the iron application. *Toadstools*. Sulphate of iron applied in liquid form about $\frac{1}{2}$ oz. to a gallon of water is also effective against these. *Worms*. A solution of lime water will bring them to the surface, when they may be swept off and buried elsewhere in the garden. The



The apple sawfly eggs are laid in the fruit blossoms and the larvæ when developed eat their way into the fruit. As soon as the fruit has formed, it is sprayed with arsenate of lead to destroy the larvæ

worm casts should be lightly distributed with a besom before rolling. (See also CHAPTER XV.)

Leaf Miners.—These attack Chrysanthemums, Carnations and many plants grown under glass. They are recognizable by white wavy markings on the leaves, and sometimes blisters. The leaves affected should be removed and burned. To prevent the egg-laying females from visiting the plants they should be sprayed with paraffin emulsion.

Leatherjacket Grub, which changes in the autumn to Daddy Longlegs, does much damage to grass, peas and beans. The only way of dealing with this is to dig a soil fumigant into the soil before planting in the case of crops, and if the pest is very bad in the lawn, the turf should be lifted and naphthalene forked in. Special naphthalene preparations are sold which can be used as top dressings and watered in.

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Mealy Bug.—This mostly appears in greenhouses, and is very difficult to destroy. Greenhouse fumigant should be used. Where only a few of the pests are evident, paint with methylated spirits.

Mice.—Are most troublesome where peas are grown, either sweet or garden varieties. Either the seed must be covered with damp carbolic powder to keep them away, or carbon bisulphide used as a soil fumigant to kill off this pest. Their holes must be found, and rag soaked in the carbon bisulphide forced into them. Great care should be taken not to inhale the gas.

Millipedes.—For full description *see under* BENEFICIAL INSECTS. A soil fumigant such as naphthalene should be dug into vacant plots to a depth of about 6 in.

Moles.—Traps are usually the most successful method of getting rid of this rather charming little nuisance. Rubber gloves should of course be used when setting them. Otherwise poison must be inserted into the burrows. This can be done by soaking cotton-wool in carbon bisulphide and placing in different parts of the burrow. If the hole by which they enter the garden can be found, rag soaked in carbolic acid can be used to plug it up. This will frighten them away. *Great care should be taken when handling poisons, and they should not, of course, be used where there are children or domestic animals.*

Onion and Leek Smut.—Sometimes called “frost” or “rust,” can only be dealt with by digging lime into the soil before planting and dipping the seeds in formalin before sowing. This disease usually appears only during a very dry, hot season.

Onion Fly.—Spray the onions with paraffin emulsion several times during the season, starting as soon as the young shoots show above the ground. Dust mixed lime and soot along the onion rows at frequent intervals. All affected plants should be burned.

Onion Mildew.—Immediate destruction of affected plants is the only way to deal with this fungus. Dusting the plants with a mixture of sulphur and lime in the early morning when the leaves are dewy will prevent the disease spreading.

Pea Beetles.—The larvæ feed on the interior of the seed. The eggs are laid on the young pea pods, and the larva burrows its way into the pea. Preventive measures should be taken. Make sure that no affected seeds are sown. To do this put your seeds in water, the peas containing the pest will float. There is no other way of dealing with this pest.

Pea Moth.—The larvæ of this moth is the one responsible for the “maggoty” peas. It can only be dealt with by digging a soil fumigant into the soil during the winter to kill the larvæ, and by burning all infested pods regularly.

Potato Disease.—Sometimes called Blight, Dry Rot or Mildew.

TREATMENT OF PESTS AND DISEASES

It can be recognized in its early stages by the brown patches on the leaves, usually round the edges. If we have a warm, wet July the disease gets a good hold, but if the weather is bright and dry the brown spots dry up and the disease is checked. When the disease gets a real hold the stems turn black and rot, giving off a most unpleasant odour. Then the spores drop to the ground and the tuber becomes infected. A slight browning of the skin is the only outward sign. The skin becomes sunken, and finally reaches the centre of the tuber. Spraying with Bordeaux or Burgundy mixture, containing copper compounds, should be carried out somewhere between the 15th and 31st July. Two sprayings should be given with three weeks between each. The mixture should not be too strong as otherwise it is inclined to scorch the foliage. When a crop is badly attacked the haulms should be cut off and burned before the tubers are dug.

Potato Scab.—This disease affects potatoes grown on damp, heavy clay soils, or very acid soils. In the latter case lime should not be used on the ground before planting, but superphosphate should be used instead. Plenty of decayed vegetable matter dug into the ground in the autumn also discourages this disease. Where the disease has occurred in bad patches, flowers of sulphur should be used at the rate of about 2 oz. per sq. yd. or 6 cwt. per acre. The potato seed is soaked in Bordeaux mixture for 12 hours before planting, but this sometimes reduces the yield.

Potato Wart Disease, is also known by many other names such as Black Scab and Potato Canker. It is a notifiable disease, and the local Agricultural superintendent should be informed if the disease appears. The blackish warts usually appear near the eyes of the potatoes when young, and increase as the tubers grow. Certain varieties are now produced that are immune from this disease, among them being Dargill Early, Great Scot, Kerr's Pink. Never plant seed from infected areas; destroy by burning all haulms and tubers so affected, and dig into the ground a good quantity of lime, and leave fallow for a season. Other good soil fumigants may of course also be used.

Raspberry Beetle.—This pest is destructive in two stages. The beetle attacks the buds and the larva the fruit. The beetle is about $\frac{1}{8}$ in. long and of a brownish colour. The larva is about $\frac{1}{2}$ in. long, yellowish in colour, with a brown head. The eggs are laid in the blossom, and the larva enter directly into the fruit. After spoiling the fruit they crawl into the bark of the cane, where they remain during the winter, coming out again about May. The canes should be sprayed in May with arsenate of lead to kill the beetles. Care should be taken in the use of this substance as it is, of course, poisonous. If there are only a few canes the beetles may be shaken off on to a sticky board and destroyed.

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Red Spider.—Chiefly attacks indoor plants, especially violets and vines. A hot dry atmosphere encourages this pest, but it is only dangerous when present in large quantities. A lime-sulphur spray in February should be applied to trees likely to be infected. In the greenhouse complete fumigation is the only effective method. With violets, as soon as the leaves turn yellow they should be removed and burned immediately, and if the plant is very yellow the whole plant should be removed and those each side of it. All plants attacked should be kept syringed, as the water helps to discourage the pest.



AFFECTED LEAVES



GOOSEBERRY SAW FLY.



LARVÆ



CHRYSALIS

The gooseberry sawfly will strip the bushes of their leaves unless controlled by spraying

Rust.—This attacks Chrysanthemums, Antirrhinums, Onions, Rose trees, fruit trees and cereals, especially during dry, hot seasons. A well-limed soil seldom produces "rusty" plants. Dust with flower of sulphur, or spray with formalin if not very bad, but destroy all slightly affected plants and foliage immediately it appears.

Sawfly.—This very destructive fly in different forms attacks nearly every fruit. Apples, Pears, Cherries, Plums, Raspberries, Gooseberries and Roses are damaged by it. Arsenate of lead or hellebore wash should be used as sprays as soon as the fruit forms. A good dressing of soil fumigant forked into the ground around the trees kills the larvæ.

Woodlice.—This pest is chiefly offensive in greenhouses, or where

TREATMENT OF PESTS AND DISEASES

there is outdoor woodwork. It is important that all rubbish should be kept out of the greenhouse, wooden seed boxes overhauled periodically and raised above the staging. All woodwork should be kept in good repair. Traps of half turnips, carrots, potatoes may be put on the staging at night, or in the garden where they are prevalent. If domestic animals or children do not visit these places, poison may be smeared on the traps to kill the woodlice outright. Copper Sulphate or Paris Green can be used in this connection.

Woolly Aphis or American Blight.—Affects Apple trees principally, but also Pears. It is easily recognizable by the cottony appearance of the pest in July. In this stage a stiff brush and methylated spirits is the best way of cleaning up the Aphis. Greasebanding in May will prevent migration from the roots, and a nicotine and soft soap spray during August will complete the methylated spirit cure. A tar-oil spray in the winter will also be beneficial.

FUNGICIDES AND WEED-KILLERS

Bordeaux Mixture.—If required for only a few fruit trees, should be purchased in paste form and diluted as instructions given on the container. Where, however, it is desired to treat an orchard, the mixture can be made up from 1 lb. of copper sulphate, dissolved in hot water, $\frac{3}{4}$ lb. of lime slaked with water into a thin cream. Add 3 gallons of water to each, and pour slowly together into one tank, thus making about seven gallons of mixture.

Certain apples are spoilt if this mixture is used for spraying. Cox's Orange Pippin is the variety most affected. Lime-sulphur spray only should be used on this tree.

Burgundy Mixture.—This is an alternative to Bordeaux Mixture, soda being used instead of lime. $1\frac{1}{2}$ lb. of soda should be used, otherwise the preparation is the same as for Bordeaux Mixture.

Carbolic Acid can be used to kill deep-rooted weeds such as Dandelions, broad-leaved Plantain and Thistles. A skewer dipped into the acid and pressed into the heart of the weeds will kill them.

Copper Sulphate is very poisonous, but is invaluable for the destruction of brown rot in fruit, mildew, and lawn fungi. An ounce dissolved in a little hot water and mixed with a gallon of water will be found suitable for most purposes. The crystals crushed and scattered over the soil surface near the haunts of slugs is an effective way to destroy these pests.

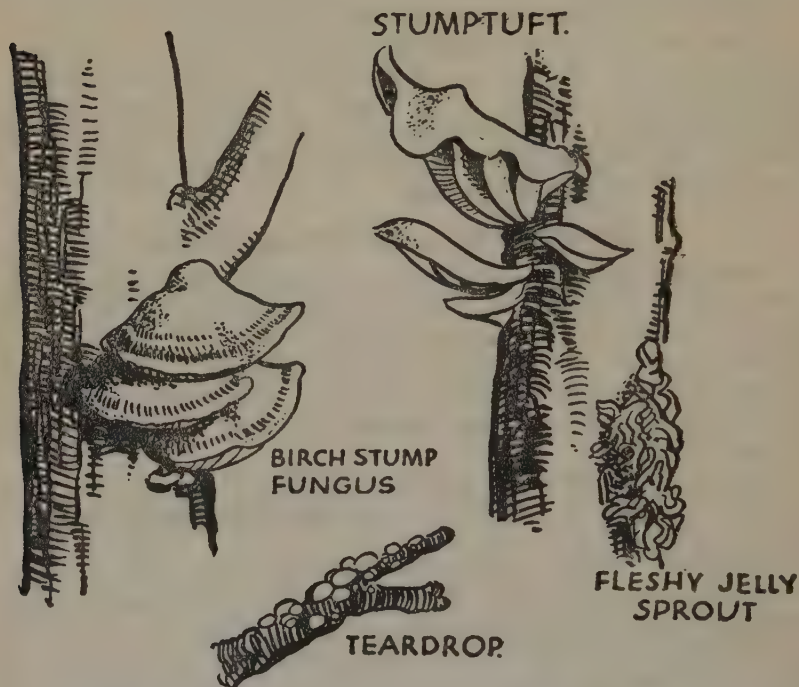
Disinfectant Solution for Green-fly.—Dissolve 2 oz. of naphtha soap or nicotine soap in a gallon of water. This will provide an excellent solution for summer spraying. Soft soap is quite good, but the purpose is best served by using a disinfectant soap such as those advised.

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Formaldehyde.—To make an effective soil drench, for sterilizing potting soil and seed composts, dissolve 4 oz. of Formaldehyde in 1 gallon of water.

Formalin.—For winter spraying—dissolve 1 tablespoonful in 1 gallon of water.

Grease-banding.—Patent grease-bands may be purchased, but a piece of grease-proof paper covered with cart grease will serve the purpose



The appearance of fungus on trees is a sign of decay. The infected part should be cut away and painted over with Stockholm tar

just as well. It should be about 6 in. wide, and tied firmly round the middle of the trunk of the fruit trees, so that the insects cannot crawl underneath. Fresh bands should be applied occasionally.

Hellebore Wash.—1 oz. of fresh ground hellebore, 2 oz. of flour, 3 gallons of water, well mixed. An excellent spray where nicotine wash is undesirable.

Lawn Sand.—This can be purchased ready mixed, but it can also be made up from 3 parts Sulphate of Ammonia, 1 part calcined Sulphate

TREATMENT OF PESTS AND DISEASES

of Iron, and 20 parts sand, to be used at the rate of 4 oz. per sq. yd. This will destroy all shallow-rooted weeds on the lawn.

Lime Salt Wash.—This is an excellent wash and easy to make. Allow 1-1½ lb. of good quick lime or freshly slaked lime to each gallon of water, and a ¼ lb. of common salt. Stir these well into the water, and before using, strain to make sure that the liquid is free from all grit.

Liver of Sulphur.—Used mostly for foliage pests and diseases, an ounce dissolved in 1-8 gallons of water according to the delicacy of the plants to be treated. The solution should be tested on one plant before proceeding with the whole job. If the leaves show sign of scorch, dilute still further.

Nicotine Wash is made by preparing ¾ oz. of nicotine, and 1 lb. soft soap, with about ten gallons of water. Dissolve the soap in a little water first, then add the nicotine, and stir the mixture well. This solution is extremely poisonous and should be treated with as much respect as arsenate of lead, that is to say, every care must be taken when it is in use, and also while it is in store.

Paraffin Emulsion.—This emulsion is a repellent against certain vegetable pests. It is easy to make; 1 pint of paraffin, and 1 lb. of soap are used to each gallon of water according to the quantity required. This solution can be bottled and stocked for future use. When preparing, first mix the soap with boiling water, thoroughly stir in the paraffin, and then bottle. The bottled solution should be diluted when used, allowing 1 part solution to 20 parts of water. This is essentially a summer wash. It should be used tepid, and applied with a syringe in the evening, not while the sun is on the plants. The strength of the solution may be varied according to the hardness of the plants.

Potassium Sulphide Solution for Bulb Mites. 1 oz. of potassium sulphide in 3 gallons of water. This mixture is a suitable one for most fungoid troubles. It has one fault, that it discolours white paint, and must therefore be used with care in the greenhouse.

Sodium Chlorate.—Recent experiments have shown this very effective against all shallow-rooted weeds such as Daisy, Clover, Couch Grass, Chickweed, Speedwell, Selfheal, narrow-leaved Plantain, etc., but Dandelions, Bindweed Thistles, broad-leaved Plantain are not appreciably affected by it. It should be used at the rate of ¾ oz. per sq. yd. in the autumn. This gives the Sodium Chlorate time to do its cleaning work before the planting season begins. About three months should elapse before planting into ground so treated.

Soil Drench. See FORMALDEHYDE.

Soil Fumigant.—When troubled with soil pests in your garden it is always wise to apply a good fumigant, which may be done whenever a

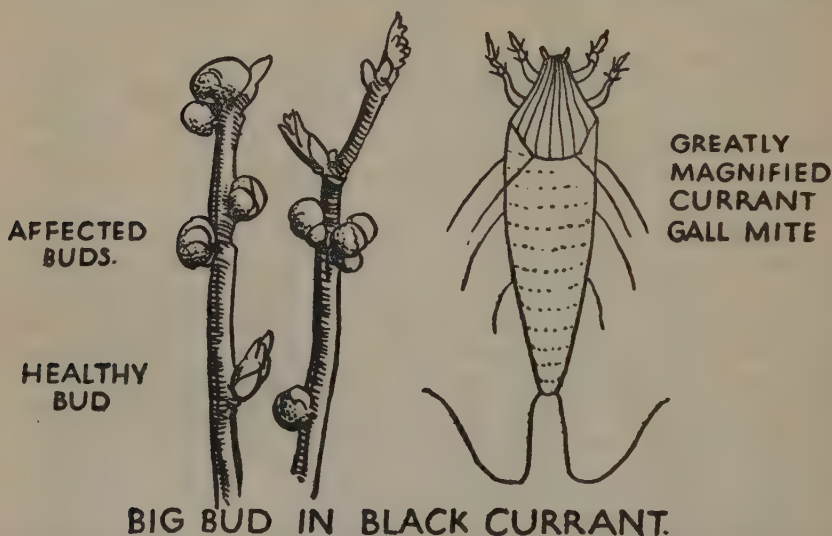
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plot is vacant. Mix together 1 lb. of crude naphthalene and 1 st. of powdered lime. To this may also be added $\frac{1}{4}$ lb. sulphate of iron. Dress the soil at the rate of 1 lb. to the sq. yd., and then fork it over so that the fumigant is buried beneath the top spit.

WHAT TO DO TO PESTS EACH MONTH OF THE YEAR

January

During calm dry weather fruit-tree spraying should be carried out. Caustic soda or tar-oil winter washes may be used. If pruning is done



Blackcurrants need a rich, moist soil and a sunny position to keep them healthy. Spray with lime-sulphur wash to control big bud mite. It is best applied just as the leaves are opening

this month, be sure to gather up and burn all twigs as they may be harbouring pests and diseases.

February

Sterilize soil for indoor tomatoes. If you sow peas this month, damp the seed and dip in carbolic powder to keep off mice. Potassium sulphate spray should be used on vines attacked by mildew.

March

Dig naphthalene or other soil fumigants into the ground before seed sowing. Remove by hand "Big Bud" from currants.

TREATMENT OF PESTS AND DISEASES

April

When sowing your lawn mix carbolic powder with the seed to keep off the birds. All fruit trees liable to be attacked by mildew should be sprayed with Nicotine wash, or in the case of gooseberries use lime sulphur.

May

Greasebanding against Woolly aphis should be renewed early this month. If the Bean aphis or Black Dolphin has appeared on the broad beans, pinch out the affected shoots, and spray with Quassia solution. Cockchafer beetles may be caught by shaking fruit trees over tarred boards or sacks. Arsenate of lead sprays should be used on gooseberries against Sawfly. Raspberries should also be sprayed against moth larvæ.

June

Look out for green-fly on rose trees and spray with soft soap solution. Cuckoo spit insect or Froghopper should be destroyed by hand if possible. Spraying with nicotine soap is fairly effective.

July

Potatoes should be sprayed with Bordeaux Mixture early this month against the potato disease. Plants such as celery and chrysanthemums liable to attack from the leaf-mining maggot should be watched and all affected leaves removed and burned. Spray with soft soap solution. Rose trees sometimes show signs of mildew during this month. Liver of sulphur spray should be used for this.

August

Towards the end of this month potatoes suffering from Potato Disease should have their haulms carefully removed and burned, leaving the tubers in the ground to ripen. Dahlias are usually attacked by earwigs, so inverted flower pot traps should be placed on the tops of their stakes.

September

Raspberries should be sprayed with arsenate of lead against Sawfly. If digging has commenced, a soil fumigant may be applied to the ground, such as naphthalene. This will be especially beneficial where Club Root is prevalent.

October

Greasebanding should be completed by the middle of this month. A good dressing of lime may be given after digging to clean the ground

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of wireworms, asparagus beetle, club root, moth grubs, cockchafer grubs, etc.

November

This is the month of bonfires. All fruit tree prunings, diseased tops of potatoes, leaves from diseased trees, and tiresome weeds, should be burned and the ashes stored for future use. Go over stores of fruit and

WOOLLY APHIS



COLONY ON TREE BRANCH.



THE WOOLLY APHIS



GALLS CAUSED BY APHIS.

Woolly aphid or American blight frequently attacks old apple trees. Spraying with tar-oil wash in winter or nicotine soap in summer are the best remedies

vegetables and destroy any showing sign of disease. Woolly aphid may be dealt with by injecting carbon bisulphide into the soil round the roots of affected trees.

December

On calm, dry days fruit tree spraying may be carried out. Green-houses and frames may be thoroughly cleaned, white-washed and fumigated if they have been visited by any pests or diseases during the past season. Flower pots, and seed boxes and pans should also be cleaned ready for spring sowings.

BENEFICIAL INSECTS

A number of the insects found in the garden, although of rather an alarming appearance, are great friends to the gardener. They are often entirely carnivorous, living on aphides and other small pests. Below are a few particulars of some of the most common, all of which should be allowed to carry out their good work and not destroyed on sight, like insect pests.

Bees.—The honey bee is a wonderful worker, and, of course, is a most welcome visitor to the garden. Without his visits practically no seed would develop on some plants, as it is on his body that the pollen is taken from flower to flower to effect fertilization. The only member of this family that is inclined to be destructive is the leaf-cutting bee but as he only disfigures the leaves, and is easily caught, he does not represent a very great menace. Bees should therefore be treated with courtesy, especially when the fruit blossoms are open. The gardener must avoid the use of poison sprays such as lead arsenate at this critical time.

Beetles.—Most ground beetles are carnivorous, living on slugs, grubs and maggots of all kinds. The most familiar are: The *Tiger Beetle*, a rich emerald green, with orange stripes, about $\frac{1}{2}$ in. in length. It covers the ground at a great pace, but, of course, flies as well, and is very difficult to catch. As it does no harm this does not matter. *Carriion Beetles* which are yellow, with a black patch on the thorax, and two on each side of the wing covers about $\frac{1}{2}$ in. long. Both the larvæ and the beetles feed on carrion, also on snails and slugs. *Burying Beetles*, black with broad orange bands, often an inch long. They also are scavengers, living on dead birds, moles, fish, frogs, etc.

Centipedes.—These are entirely insectivorous and should not be mistaken for millipedes, which are very harmful. The centipede is flat and yellow, and has a large number of legs. It runs very fast with a slightly crab-like movement. Millipedes are almost black in colour, rounded in shape and when touched roll into a ball. The millipedes move slowly—a fact which applies to most of the insects that are vegetarian, and therefore harmful. Having no need to catch their food, they approach it in leisurely fashion.

Devil's Coach Horse, or Cock-tail Beetle. This is a narrow black beetle which has a habit of raising its head and tail in a rather threatening manner when touched, hence its name. It feeds on slugs, and other soil pests.

Dragon Flies.—These wonderfully beautiful flies, too well known to need description, are insectivorous, and live entirely on minute insects. They have no sting, although they are often called "Horse Stingers."

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Hover Flies.—The larvæ live almost entirely on aphides, and therefore destroy large quantities. There are several varieties. The common ones seen hovering over rose trees and fruit trees are easily recognizable.

Ichneumon Flies.—There are thousands of varieties of this particular insect which varies in size from that of a midge to about 2 in. across the wings. They have long thin bodies and very long legs. They hunt for caterpillars of all kinds, and lay their eggs in the bodies of their victims. The grubs hatch out and feed on the caterpillars, thus killing off large numbers of them. Cabbage caterpillars are a favourite victim.

Lacewing Fly.—This is another very beautiful insect, with 4 large gauzy wings, and a thin bright green body. On account of its brilliant golden eyes it is sometimes called the Golden-eyed Fly. It is mostly found near water, and lays its eggs under leaves, each one being attached by a thin silken thread. The larvæ sucks the juices from aphides (green- and black-fly).

Ladybirds, sometimes called Cow Ladies. These live almost entirely on green-fly, and are found on rose trees and other plants subject to this pest. There is no need to describe them, as even the youngest and most amateur gardener knows this charming little spotted beetle.

Spiders feed on insects of all kinds, and are so well known there is no need to describe them.

Wasps (small varieties and Hornets), in spite of the fact that they eat into fruit, are really beneficial. They remove the wings from ordinary house flies, and take the bodies home to their young. They eat grubs in large quantities. Thus hornets and small wasps not only clear the garden of pests, but also fight disease-carrying flies that invade the house.

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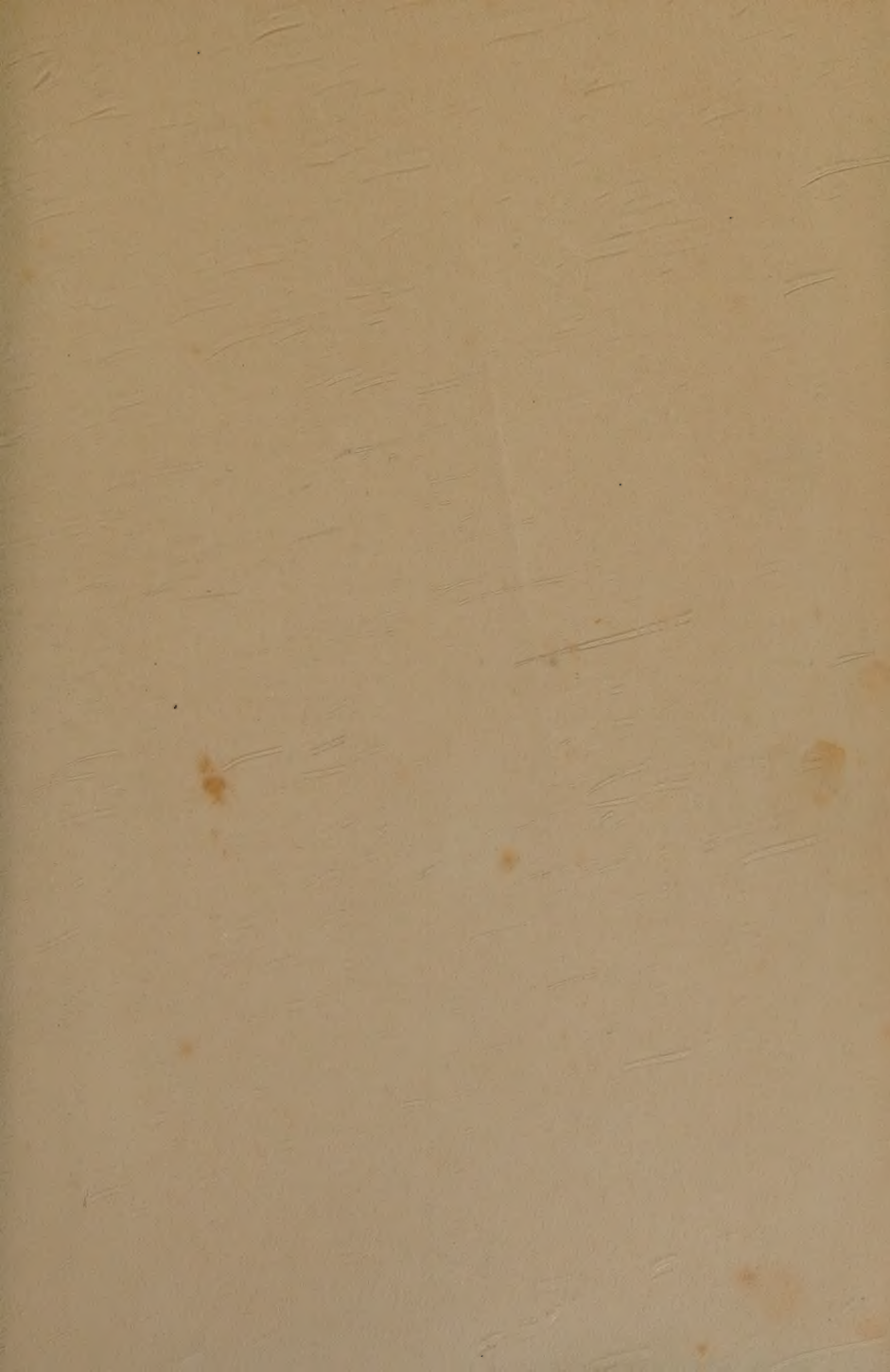
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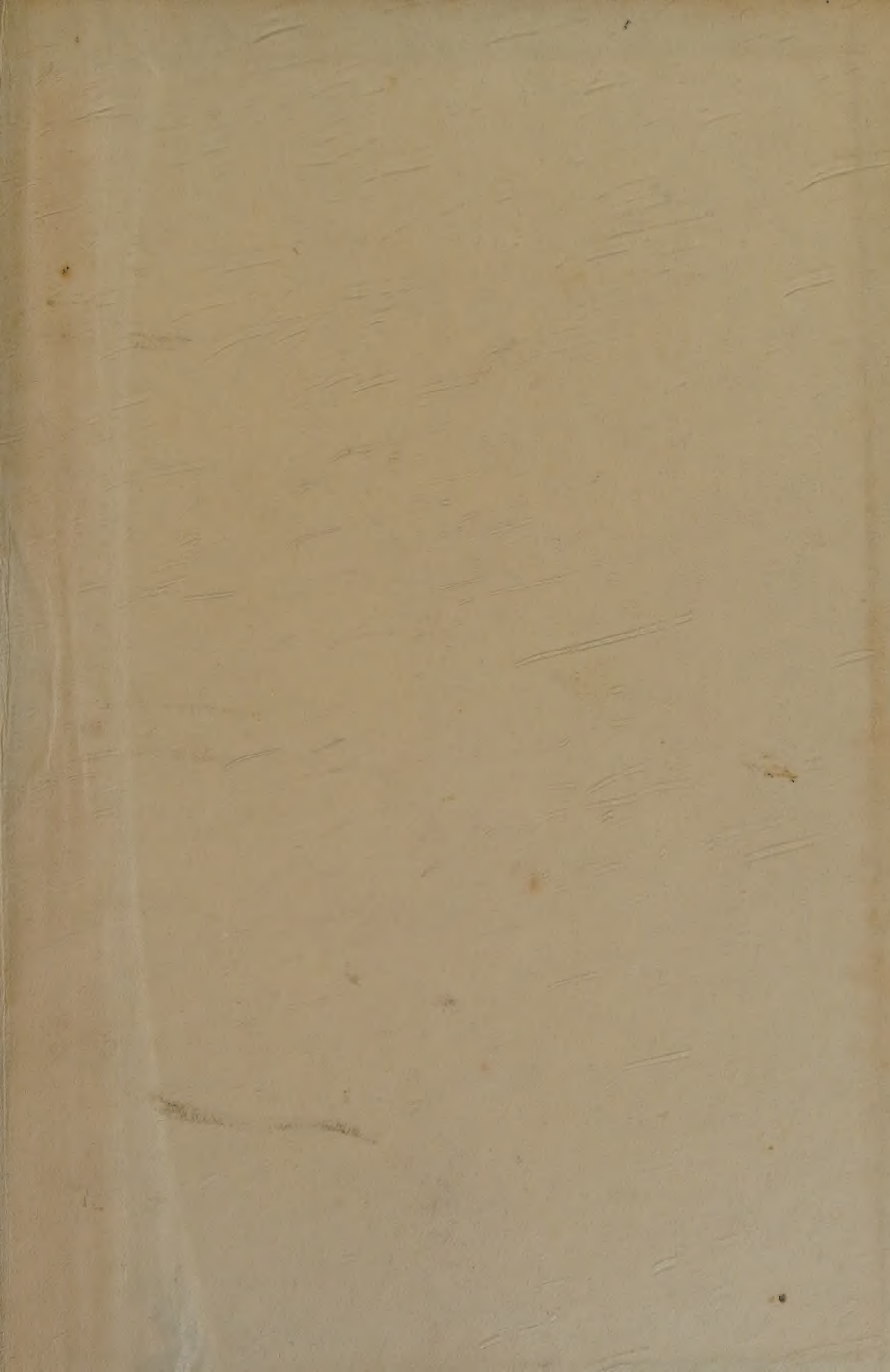
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